Intelligent Search Application Development Guide

A Guide to Customizing and Extending InQuira

InQuira Version 8.2.2

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Preface About This Guide

This guide provides information about integrating and customizing the InQuira 8.1 Personalized Response User Interface. It describes the components and elements that make up the User Interface, and includes guidelines for:

- Incorporating the User Interface into your web architecture
- Customizing User Interface appearance and functionality
- Implementing special features

This guide also provides information for application developers who want to customize or extend InQuira 8.1 through its API. For information on configuration-based changes or changes to InQuira 8.1 that are not accomplished through its API, refer to the *Intelligent Search Optimization Guide*.

For a full discussion of the InQuira 8.1 architecture, components, and instances refer to the *Intelligent Search Administration Guide*. For information about setting up the development environment and deploying customizations and code changes to the production environment also refer to the *Intelligent Search Administration Guide*.

This preface includes information on:

- The general organization of this guide
- The support services available from InQuira Customer Support
- The available product documentation

In This Guide

The Intelligent Search Application Developer's Guide is divided into the following sections:

Chapter 1, The InQuira User Interface	This section describes the basic functions of the User Interface and input format of the application responses.
Chapter 2, User Interface Components	This section describes the templates that define the User Interface functionality and presentation.
Chapter 3, User Interface Elements	This section describes the various request and response elements within the User Interface.
Chapter 4, Customizing the User Interface	This section describes the process of specifying User Interface layout, individual element styles, and implementing Personalized Response features.
Chapter 5, Implementing Optional Features	This section describes optional User Interface features that you can use within your application.
Chapter 6, Creating a Custom Content Crawler	This section shows you how to implement a custom DB Web crawler.
Chapter 7, Creating a Custom Document Preprocessor	This section discusses common preprocessing tasks and provides an example based on which you can develop your own preprocessing routines.
Chapter 8, Creating a Custom Task	This section shows you how to create a custom task.
Chapter 9, Creating a Custom Authentication Interface	This section shows you how to create a custom authentication interface.
Chapter 10, Integrating an External Authentication Application	This section shows you how to integrate InQuira 8.1's authentication with an external application.
Chapter 11, Creating an Action Plugin	This section shows you how to create and integrate an action plugin that executes when a rule is invoked.
Chapter 12, Creating a Custom Preference Handler	This section provides a template for developing preference handlers.

Chapter 13, Rendering Web Pages Using a Custom Agent	This section provides an example of how to integrate a custom agent bypassing the web page rendering functionality built into InQuira 8.1.

Contacting InQuira

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World Wide Web:	Learn more about InQuira products, solutions, services, and support on the world wide web at: **www.inquira.com**.

InQuira Product Documentation

InQuira documentation is available only to licensed users of our software products and may not be redistributed in any form without express permission from InQuira, Inc.

The InQuira documentation is available in PDF format.Customers can download the PDF files from:

http://documentation.inquira.com/

NOTE: You need a PDF reader application installed on each processor on which you plan to view the InQuira product documentation. The Adobe Acrobat reader is available from Adobe Systems at: http://www.adobe.com.

Detailed information about each product document set is available in:

- *Intelligent Search Documentation* on page 4
- *InQuira Analytics Documentation* on page 6
- *Information Manager Documentation* on page 6
- *Contact Center Documentation* on page 7

If you encounter a problem, need help using the documentation, or want to report an error in the content, please contact InQuira Customer Support.

If you need help obtaining InQuira product documentation, or want to obtain permission to redistribute a portion of the contents, please contact your InQuira account representative.

Intelligent Search Documentation

Intelligent Search is distributed with the following documentation.

Document	Number	Description
Intelligent Search Installation Guide	IS80-IG-00	This guide is intended for technical staff who are responsible for installing InQuira 8.1. It provides detailed information on installing InQuira 8.1 and configuring the application on a single processor using the Installation Configuration Environment facility.
Intelligent Search Administration Guide	IS80-CA-00	This guide is intended for system and application administrators who need to configure an InQuira 8.1 application in an enterprise environment. It describes InQuira 8.1 integration, development, configuration, and maintenance processes and tasks.

Intelligent Search Language Administration Guide	IS80-LA-00	This guide is intended for business users and subject matter experts who need to create and maintain the language processing elements of an InQuira 8.1 application using the System Manager. This book provides usage information about the System Manager, conceptual information about the InQuira 8.1 language objects, and task information about the process of managing the user experience provided by the InQuira 8.1 application.
Intelligent Search Language Tuning Guide	IS80-LD-00	This guide is intended for application developers who need to create and maintain advanced InQuira 8.1 language-processing elements using the Dictionary and other InQuira Language Workbench applications.
Intelligent Search Optimization Guide	IS80-AG-00	This guide is intended for application developers who need to implement InQuira 8.1 advanced features, including Personalized Navigation and Process Wizards.
Intelligent Search Application Development Guide	IS80-API-00	This guide provides information about integrating and customizing the InQuira 8.1 Personalized Response User Interface.
Intelligent Search Language Reference	IS80-LRG-00	This guide is for language developers implementing InQuira 8.1 applications that utilize the intent libraries and advanced language processing functions. These guides are published as separate documents that provide reference information for each industry-specific intent library. Each reference also contains complete descriptions of InQuira Match Language and Variable Instantiation Language.
Intelligent Search User Interface Guide	IS80-UI-00	This guide is intended for application developers who need to customize the InQuira 8.1 Personalized Response User Interface, and integrate it with a production web application. It contains information about the elements and features of the User Interface, and provides guidelines for integrating it into an enterprise web architecture, customizing its appearance and functionality, and implementing various special features.

InQuira Analytics Documentation

InQuira Analytics is distributed with the following documentation.

Document	Number	Description
InQuira Analytics Installation Guide	IA80-IG-00	This guide is intended for technical staff who are responsible for installing InQuira Analytics. It provides detailed information on installing and configuring the InQuira Analytics product for use with an InQuira 8.1 application.
Analytics User Guide	IA80-CA-00	This guide is intended for systems and application administrators who need to configure the Intelligent Search and Information Manager Analytics components to report on InQuira 8.1 application performance.

Information Manager Documentation

InQuira Information Manager is distributed with the following documentation.

Document	Number	Description
Information Manager Installation Guide	IM80-IG-00	This guide is intended for technical staff who are responsible for installing InQuira Information Manager. It provides detailed information on installing and configuring the Information Manager product.
Information Manager Administration Guide	IM80-CA-00	This guide is intended for systems and application administrators who need to configure and administer an InQuira Information Manager application, and integrate it with an InQuira 8.1 application. It also contains information for general business users who need to use the Information Manager to create and manage content.
Information Manager Content Authoring Guide	IM80-AG-00	This guide is intended for technical staff who are responsible for authoring content in InQuira Information Manager. It provides detailed information on creating content and managing workflow tasks in the Information Manager console.
Information Manager Developer's Guide	IM80-WSR-00	This guide is intended for application developers who need to integrate Information Manager content, content category, and user and security functions with external applications. It contains reference information and examples for all packages, classes, methods, and interfaces of the Information Manager Web Services API.

Contact Center Documentation

The InQuira 8.1 contact center products are distributed with the following documentation.

Document	Number	Description
Contact Center Advisor Integration Guide	CA80-IG-00	This guide is intended for application developers and systems administrators who need to plan for and integrate the InQuira Contact Center Advisor with an InQuira application and a supported CRM application.
Intelligent Search Siebel Integration Guide	CAS80-IG-00	This guide is intended for application developers and systems administrators who need to plan for and integrate InQuira 8.1 with Siebel 7 Enterprise Applications using the Siebel Adapter for InQuira 8.1.

Screen and Text Representations

The product screens, screen text, and file contents depicted in the documentation are examples. We attempt to convey the product's appearance and functionality as accurately as possible; however, the actual product contents and displays may differ from the published examples.

References to World Wide Web Resources

For your convenience, we refer to Uniform Resource Locators (URLs) for resources published on the World Wide Web when appropriate. We attempt to provide accurate information; however, these resources are controlled by their respective owners and are therefore subject to change at any time.

Chapter 1 The InQuira User Interface

The InQuira 8.1 Personalized Response User Interface is a full-featured graphical user interface designed to integrate easily with your existing production web site. The User Interface provides the elements required for processing requests and presenting responses, and supports additional optional features that you can implement as desired.

To use the User Interface in a production web environment, you must:

- Integrate it into your web site's navigation and presentation scheme
- Customize it to conform to your organization's functional and presentation requirements
- Implement any desired optional features as described in *Chapter 5, Implementing Optional Features*

The User Interface is installed as part of the standard product installation.

NOTE: The User Interface is available only as an HTML-based user interface for use with a configured InQuira 8.1 web application. For information about implementing InQuira 8.1 using other technologies, contact your InQuira account representative.

The Personalized Response User Interface

The InQuira 8.1 User Interface incorporates InQuira's Personalized Response concept, which presents direct answers to user requests in its main answer area, and categorized related information in that you configure within the Dictionary.

The Personalized Response User Interface organizes various types of related responses into separate graphical areas, or portals, enabling you to establish consistent, focused, and targeted presentation for various types of application content, such as general site information, online glossaries, promotional material, and site features, such as calculators and other tools.

User Interface Processing

The User Interface contains all of the elements required to solicit user questions and present categorized application responses. During request processing, the User Interface:

- Passes user input to the application for processing. See *Chapter 1, Dictionary Manager Advanced Features* in the *Intelligent Search Optimization Guide* for an overview of application request and response processing.
- Receives formatted responses from the application. See *Application Response Format* on page 10 for information about the response format.
- performs final formatting and displays responses to the end user, as specified by the configured presentation elements as described in *Chapter 4, Customizing the User Interface*.

Application Response Format

The application passes responses to the User Interface as a file that conforms to an internal Extensible Markup Language (XML) document type definition (DTD). The User Interface templates are stylesheets that transform the XML into formatted HTML for presentation within a browser.

The response file is divided into sections:

- *The Parameters Section* on page 10
- *The Answers Section* on page 11
- *The Query Section* on page 12

The Parameters Section

The parameters section provides meta-information about the response, such as context information and other configuration parameters. The User Interface uses this information to retrieve page parameters, server URLs, and other required information.

The following example is an excerpt from a typical parameters section.

```
<params>
<param name="type">AnswerQuestion</param>
<param name="Question">how much can I contribute to a Roth ira in?
<param name="baseURL">http://lcdemo2:8222/htmlagent/ui.jsp</param>
</params>
```

The Answers Section

The answers section contains the various content responses (answers) to the request (question). Factors that determine the number of answers passed to the User Interface include:

- The number of content matches (answers) located in the application content
- The scores associated with the located answers

The results file groups answers according to answer purposes, which are specified in the Dictionary. The User Interface displays answers associated with each purpose in a specific section, or portlet of the response page. The maximum number of answers within each portlet is determined by display thresholds. See *Configuring Answer Purposes* on page 48 for more information about answer purposes and how they are displayed by the User Interface.

The following example includes a general answer and an answer assigned to the purpose `link to category`.

```
<answer score="1.0">
   <answer type="unstructured" score="0.6691748880962431"
   <section>
      <title idx="0"
      <snippet lvl="0">Financial
      </title>
      <text idx="1"
      <snippet lvl="1">Only married couples with
      <snippet lvl="3"> $ 150 </snippet>
      <snippet lvl="1"> , 000 or less and singles
      .
      .
      .
      </text>
   </section>
   <highlighted_link
   <similar_response_link
   </answer>
</answer>
<link_to_category score="1.0">
<answer type="custom" score="1.0">
   <sentence type="code">&lt;a
   <title type="code">Roth IRA</title>
</answer>
```

The Query Section

The query section contains history information associated with the session, such as previously asked questions. The User Interface uses this information to present session information with results.

The following example is an excerpt from a typical query section.

```
<query>
<question transactionId="1">
<original>how much can I contribute to a Roth ira in
<paraphrase>how much can I contribute to a Roth ira in
</question>
</query>
```

Chapter 2 User Interface Components

The User Interface consists of a set of templates that use Extensible Stylesheet Language Transformation (XSLT) and HTML Cascading Style Sheets (CSS) to define presentation characteristics.

The set of templates includes the main template, called `main.xsl`, and subordinate templates that contain the elements required for User Interface implementation.

The templates contain presentation and navigation design elements, such as:

- Page layouts
- Functional elements, such as user input elements and response presentation elements
- Global elements, such as color schemes and font families

The templates are pre-configured with default values for required elements.

In addition to the required User Interface elements, the templates contain elements that support optional features, such as Personalized Navigation, direct page display, and dialog-style user interaction.

See *Chapter 3, User Interface Elements* for more information about the elements of the User Interface.

The Main Template

The main template specifies the set of subordinate templates that determine the layout, functional elements, and style of the User Interface. The main template also specifies additional utilities and directories that provide basic functional or graphical elements.

You need to modify the main template to integrate the User Interface with your site's navigation structure. The main template is located in:

<InQuira_home>/inquira/int/xsl/search

The main template specifies subordinate templates as include statements. *Main Template File Example* on page 14 contains a sample section of the main template showing its structure.

See *Chapter 4, Customizing the User Interface* for more information on using the main template.

Main Template File Example

```
<?xml version="1.0"?>
<xsl:stylesheet xmlns:xsl="http://www.w3.org/1999/XSL/Transform" version="1.0">
<!-- General -->
<xsl:import href="config.xsl"/>
<xsl:import href="globals.xsl"/>
<xsl:import href="includes.xsl"/>
<xsl:import href="../common/util.xsl"/>
<!-- Options for Search UI Main Screens -->
<xsl:import href="ui_search_basic.xsl"/>
<!--xsl:import href="ui_search_and_browse.xsl"/-->
<!--xsl:import href="ui_search_vrep.xsl"/-->
<!-- Other search UI pages -->
<xsl:import href="instant_answer_page.xsl"/>
<xsl:import href="user_comments_page.xsl"/>
<!-- Search UI Main Areas -->
<xsl:import href="results.xsl"/>
<xsl:import href="sidebar.xsl"/>
<xsl:import href="structured_details.xsl"/>
<xsl:import href="tips.xsl"/>
<xsl:import href="error.xsl"/>
<!-- End of Imports -->
<xsl:output method="html" indent="yes"/>
<xsl:strip-space elements="*" />

<!-- Override the default, empty resource file with our own for the search UI -->
<xsl:variable name="resource-file" select="document('resource.xml')" />

<xsl:template match="/">
   <xsl:choose>
      <xsl:when test="$error-message">
         <xsl:call-template name="error-page" />
      </xsl:when>
      <xsl:when test="$show-user-comments-page">

         <xsl:call-template name="user-comments-page" />
      </xsl:when>
      <xsl:when test="$show-instant-answer-frame">
         <xsl:call-template name="instant-answer-frame" />
      </xsl:when>
      <xsl:when test="$instant-answer and not($no-jump or $show-definition-detail-page or
```

```
$show-structured-detail-page)">
          <xsl:call-template name="instant-answer-page" />
        </xsl:when>
        <xsl:otherwise>
          <xsl:call-template name="question-and-results-page" />
        </xsl:otherwise>
    </xsl:choose>
</xsl:template>

</xsl:stylesheet>
```

The Global Layout Style Templates

The layout style templates determine the basic format of the User Interface request and response pages. You specify the following layout templates using an include statement in the main template file.

- The standard response page format (`ui_search_basic.xsl`)
- The Personalized Navigation layout (`ui_search_and_browse.xsl`)
- The Virtual Representative layout for (`ui_search_vrep.xsl`)

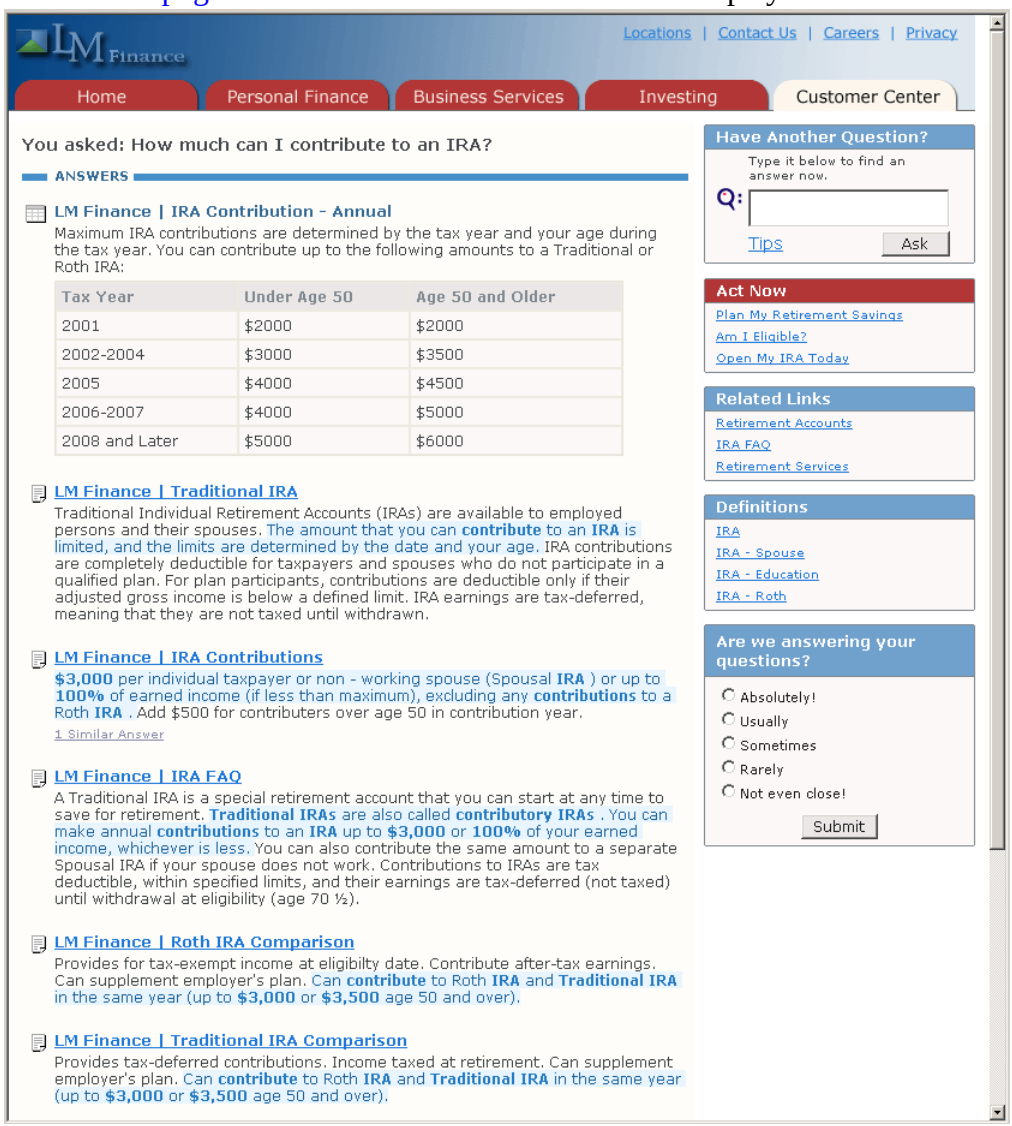
The standard response page template is enabled by default, as shown in the following example:

```
<!-- Options for Search UI Main Screens -->
<xsl:import href="ui_search_basic.xsl"/>
<!--xsl:import href="ui_search_and_browse.xsl"/-->
<!--xsl:import href="ui_search_vrep.xsl"/-->
```

See *Chapter 5, Implementing Optional Features* for more information on enabling the alternate global layout styles.

Basic Search Layout Display Example

The basic search layout provides a large left-column answer area, and the question input area and related information portlets arrayed in the right column. *Answer Display Features* on page 25 describes features of the answer displays.



Request and Response Element Templates

The request and response element templates determine the basic format and content of the request and response elements within the specified layout.

Global Configuration Parameters Template

The configuration parameters template specifies global settings for both request and response elements. The `config.xsl` template contains User Interface configuration parameters, such as section headers and feature switches. *Sample Configuration Parameters File* on page 17 provides a sample of the file contents.

Sample Configuration Parameters File

The following is a sample of the configuration parameters file, `config.xsl`.

```
<?xml version="1.0" ?>

<xsl:stylesheet xmlns:xsl="http://www.w3.org/1999/XSL/Transform" version="1.0">

<!--
  - Configurable variables
  -->

<!--
  - Score Thresholds
  -
  - best-answers-min-score: Minimum score required to be considered one of the best answers
  - best-answers-min-diff: Minimum difference between scores required before being cut off from
the best answers
  - best-answers-max-display: Maximum # of best answers to display
  -->
<xsl:variable name="best-answers-min-score"         select="0.90" />
<xsl:variable name="best-answers-min-diff"          select="0.01" />
<xsl:variable name="best-answers-max-display"       select="3" />

<!--
  - The spellchecker returns suggestions with scores between 0 and 100.
  - This sets the minimum score required before a suggestion is made to the user.
  -->
```

```
<xsl:variable name="spellcheck-min-suggest-score"   select="90" />
<!--
  - User Interface Options
  -->
<xsl:variable name="default-charset"               select="'UTF-8'" />
<xsl:variable name="get-user-feedback"              select="true()" />
<xsl:variable name="show-search-running-indicator"  select="true()" />
<xsl:variable name="debug-full-excerpt"             select="false()" />

</xsl:stylesheet>
```

Request Element Templates

The request element templates determine the basic format and contents of the request elements within a specified layout.

Request elements

`question.xsl`

This template specifies standard question interaction using the question boxes, example questions, and other user input elements. You must specify this template or the alternative dialog-style elements. This template is the default. *Request Area Example* on page 19 provides a sample request area display.

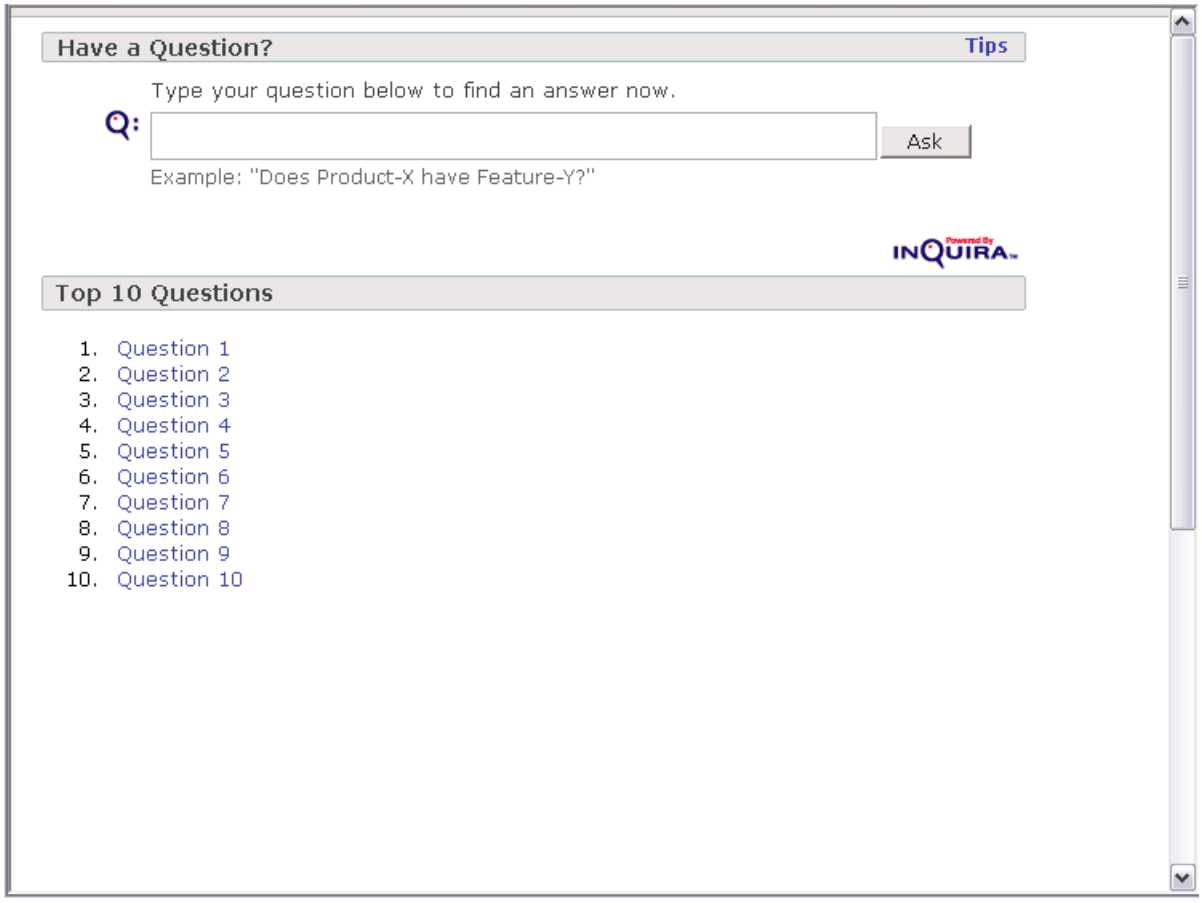
Dialog-style elements

`question_vrep.xsl`

This template specifies dialog-style question interaction for use with virtual representatives (VREPs) or similar implementations, as described in Implementing a Virtual Representative.*Dialog Request Area Example* on page 20 provides a sample dialog-style request area display.

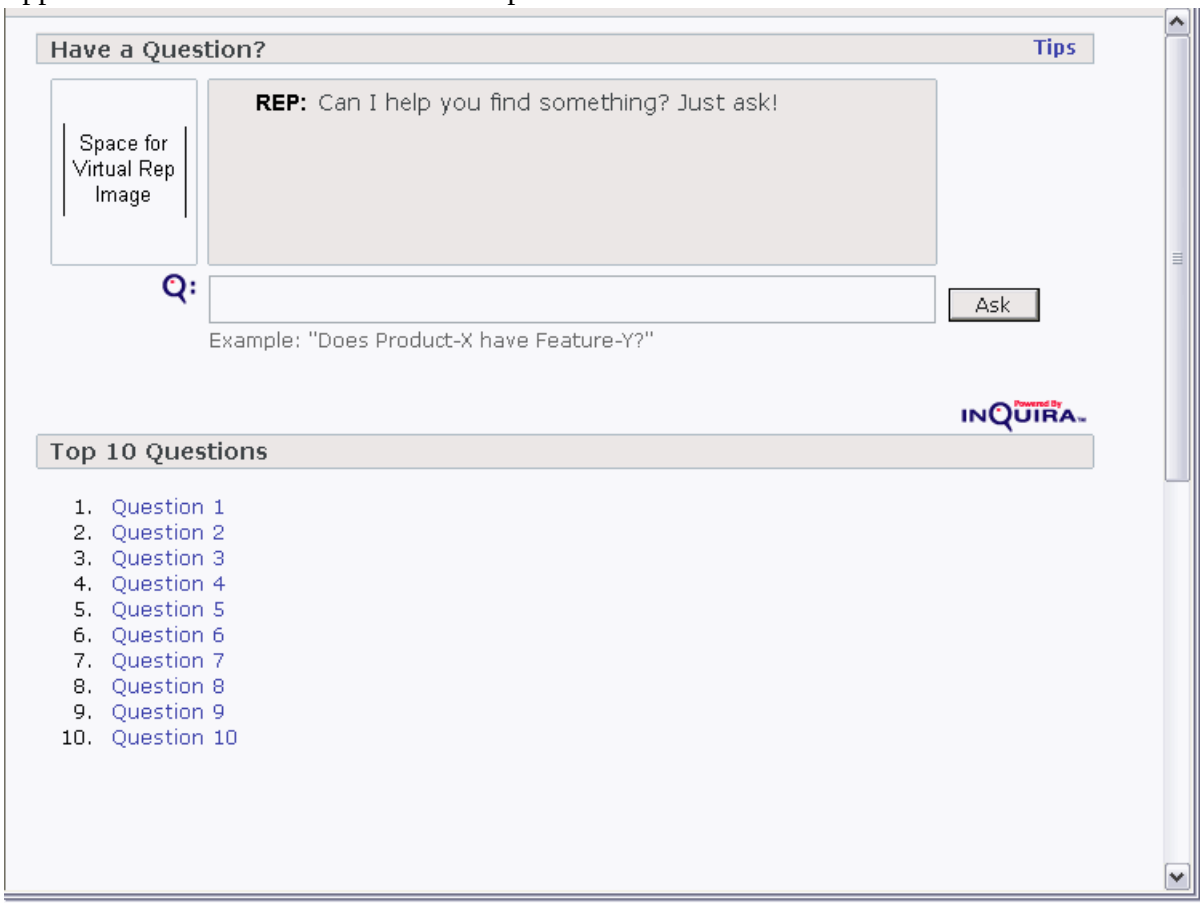
Request Area Example

The default request area provides the functional and presentation elements required for integrating a request area into pages within your web site. The request area elements are described in more detail in *Request Elements* on page 23.



Dialog Request Area Example

The dialog-style request area provides the functional and presentation elements required for integrating a dialog-style request area into pages within your web site. The request area elements are described in more detail in *Request Elements* on page 23. See Implementing a Virtual Representative for more information about using the dialog style template to support user interaction with a virtual representative.



Response Element Templates

The response element templates determine the basic form and content of the response elements.

Standard answer elements

`results.xsl`

This template contains elements for presenting standard answers, and also contains the basic building blocks for answers used by all answer purposes.

Portlet answer elements

`sidebar.xsl`

This template contains elements that generate the portlet display area of the response page. The portlet display area displays all answer purposes except standard, dialog, and direct page display.

See *Default Answer Purposes* on page 27 for information on default answer purpose presentation.

User Interface error messages

`error.xsl`

This template specifies the format for displaying error messages. This template is required.

Global Elements and Utilities

The global element templates specify basic colors, fonts, and section headings and other variables used throughout the User Interface. The utilities files include graphics directories and basic usability functions. You can specify elements within these templates for either the two- or three-column layout style.

Common elements

`includes.xsl`

This template contains the elements that support inclusion of basic style sheets and utilities, such as CSS and JavaScript.

Global Javascript file

`qna_common.js`

This is the main JavaScript file, located in `<InQuira_home>/inquira/int/js`. It contains basic JavaScript functions used on the request and response pages.

Common element style sheet

`qna_style.css`

This is the style sheet, located in `<InQuira_home>/inquira/int/js`, that defines the basic common elements, such as fonts and colors, for the request and response page elements. See *Customizing General Style Elements* on page 36 for more information on the style elements.

Common image directory

`images/*.gif`

This directory contains various images used throughout the User Interface. It also stores custom images, such as character images for dialog-style interaction, as described in Implementing a Virtual Representative.

Chapter 3 User Interface Elements

The various templates and style sheets within the User Interface define the elements that process user requests and display application responses. Request elements and response elements include both functional elements, such as the question input box, and presentation elements, such as color schemes and heading text, that organize the application functions into a meaningful visual display.

Request Elements

The functional and presentation elements of the user request area appear on the initial request page and on the response page. Request elements include the question box for user input and other functional and graphic elements.

Element	Description
Request Area	Defines the request area elements.
Request Heading	Specifies the text that appears at the top of the request area. See *Customizing the Request Heading* on page 44.
Example Question	Specifies the example question text that appears below the request heading. See *Customizing the Example Question* on page 44.
Question Box	Defines the text input box. See *Customizing the Question Box* on page 45.
Tips Link	Specifies the link to the User Interface help page. See *Customizing the Tips Link* on page 45.
Submit Button	Specifies the request submittal mechanism. See *Customizing the Submit Button* on page 45.

Response Elements

The User Interface displays answers and related information on the response page. The response page is divided into several functional areas:

- The request area, which provides the means for users to ask additional questions
- The answer area, which presents the application responses that directly the user's question
- The related information area, which presents related responses, grouped into separate portlets by answer purpose

NOTE: You can also use the direct page display feature to display the document that contains the answer to a specified request directly on the response page. Direct page displays supersede the standard answers. See Implementing Direct Page Display for more information on configuring the direct page display feature.

Response elements include answers, which are composed of various configurable sub-elements, and other functional and graphic elements.

Element	Description
Answer Area	Defines the answer display area on the response page. See *Customizing Response Elements* on page 46.
Question Echo	Specifies the display of the user's question on the response page. See *Customizing the Question Echo* on page 46.
Answer Introduction	Specifies text that introduces the answer. See *Customizing the Answer Introduction* on page 47.
Answer Heading	Specifies the format of the document titles displayed as answer headings. See *Customizing Answer Headings* on page 47.
Answer Body Text	Specifies the display font for answers on the response page. See *Customizing the Answer Body Text* on page 47.
Answer Document Link	Specifies the format of the link text within answers. See *Customizing the Answer Document Link* on page 48.
Related Information	Specifies the format of the elements that make up the answer portlets. See *Customizing Response Elements* on page 46.

Answer Display Features

The User Interface contains features that display a variety of visual cues that accompany answers. These features include:

Answer source icons

Answer source icons indicate the type of document or information source in which the answer is located. They are passed in the XML response format in a standard attribute called `docType`. The User Interface displays icons for the following answer sources:

- Answers from structured information (database) sources: 
- Answers from HTML, newsgroups, Microsoft PowerPoint, and ASCII text documents: 
- Answers from PDF documents: 
- Answers from Microsoft Word documents: 
- Answers from Microsoft Excel documents: 
- Images: 

Answer highlighting and question-word emphasis

The stylesheet `qna_style.css` contains settings to emphasize words and phrases in the answer excerpt. Various levels of emphasis are defined in the User Interface, and these levels correspond to values defined for primary and secondary word-matching and proximity to words occurring in the user's question. Matching words are determined by the language analysis process, which takes into account w*ord-form va*. The default setting applies a bold style **(bold**) and a blue background to matching words.

Similar answer link

The similar answer link provides access to answers derived from other pages on the site having similar content that were found in the search. This feature enables the User Interface to consolidate duplicate pages, or pages that re-use a substantial amount of content, in the initial response. Users can click on the link to display the full answer page including the similar answers.riations, synonyms, and other semantic relationships, as described in the *Intelligent Search Language Tuning Guide*.

Answer Purposes

Answer purposes are categories to which you assign answer actions within Dictionary rules. Answer purposes correspond to display characteristics defined in the User Interface, enabling you to establish consistent, focused, and targeted presentation for various types of application content, such as general site information, online glossaries, promotional material, and site features, such as calculators and other tools.

InQuira 8.1 is installed and configured with a standard set of answer purposes, described in *Default Answer Purposes* on page 27, which are designed for use with the Personalized Response User Interface. The default answer purposes associate each purpose with a defined response category area, or portlet, of the answer page.

You use answer purposes by:

- Assigning answer purposes to actions within Rules, as described in *Rules* in the *Intelligent Search Language Tuning Guide*.
- Configuring presentation characteristics for User Interface portlets, as described in *Configuring Answer Purposes* on page 48.

NOTE: In contrast with answer purposes, answer methods correspond to type of data or method used to supply the answer. Examples of answer methods include querying structured data, searching the indexed unstructured content, and displaying custom content. See *Answer Action Methods for Rules* in the *Intelligent Search Optimization Guide* for more information on answer methods.

Default Answer Purposes

The standard set of answer purposes described below are designed for use with the Personalized Response User Interface.

Purpose	Description	Default Response Template	Default Presentation
Answer	Displays responses that directly address the user's question.	Answer Template	In the Answer area of the response page
Act	Displays links that provide actions that the user can take on the web site.	Act Template	In the **Act Now** portlet
Promote	Displays cross-sell or up-sell advertisements for products related to the intent of the question.	Promote Template	In the **Promotion** portlet
Related Topic	Displays links to major topic categories defined for the web site.	Link To Category Template	In the **Related Topics** portlet
Define	Displays links to terms used in the question as well as similar content.	n/a	In the **Definition** portlet
Jump to Page	Displays content configured in the Dictionary for use with the direct page display feature.	n/a	See *Implementing Direct Page Display* on page 61.
Converse	Displays conversational response intended for use with a virtual representative on the response page.	Converse Template	See *Implementing a Virtual Representative* on page 63.
Feature Content	Displays specific featured content from the web site that supplements the answers.	Feature Content Template	In the **Featured Content** area of the response page
Contact	For use with the Contact Deflection feature.	n/a	See the section on Implementing Contact Deflection for Web-based Email.

Answer Portlets

User Interface portlets are defined regions of the answer page. Portlets enable you to categorize responses displayed on the answer page according to purpose; some desirable responses are direct answers to user questions, while others might be information about related promotions, services, tools, and terms.

The User Interface is installed with a set of default portlets that correspond to the purposes that you can specify specific responses within the application Dictionary.

In general, the User Interface portlets are designed to accept and present information associated with any type of answer action that can be specified within a Rule; however, this section does describe limitations and suggested applications where appropriate.

See the *Intelligent Search Language Tuning Guide* and *Intelligent Search Optimization Guide* for more information on the Dictionary, Rules, actions and answer purposes and methods.

Default Answer Portlets

The User Interface is installed with several pre-defined portlets. Each portlet is designed to present answers with a specific purpose, as described in *Answer Purposes* on page 26

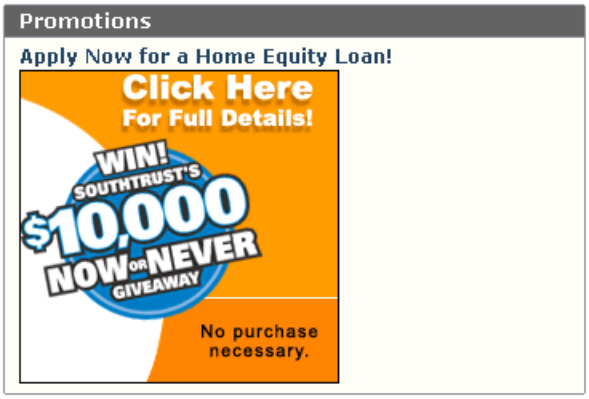
The following table describes the available default portlets. The default answer page displays the portlets in a single column to the right of the answer area. The portlets are listed here in the order in which they are displayed in the default User Interface.

Portlet	Usage
Promotions	Use this portlet to display promotional information, such as cross-sell or up-sell advertisements for products related to the intent of the question. You can configure responses to include graphics as links to pages that contain more detailed information. See *Promotions Portlet Example* on page 30 for more information.
Act Now	Use this portlet to display information about relevant activities that users can perform immediately on the site. This portlet favors concise, imperative messages that compel users to access beneficial features. See e *Act Now Portlet Example* on page 31 for more information.
Learn More	Use this portlet to display brief summaries of content areas that are relevant to the user's question, such as tools and calculators. See *Learn More Portlet Example* on page 32 for more information.
Definition	Use this portlet to display definitions of terms related to the user's question. This portal is ideal for displaying existing glossary information adapted from various formats. See *Definition Portlet Example* on page 33 for more information.
Feature Content	Use this portlet to display more detailed information about relevant content areas and site features, such as tools and calculators. The Feature Content portlet displays responses in the lower portion of the answer area and not in a segregated box, which provides space for more detailed information, such as graphical tools. See *Feature Content Portlet Example* on page 34 for more information.

Promotions Portlet Example

The Promotions portlet is intended to display relevant promotions and special offers. The Promotions portlet provides an opportunity to create effective context-sensitive marketing by configuring Promotional responses based on products or services mentioned the user's question.

The Promotions portlet can display responses generated by any of the available answer methods; however, it is well-suited to present custom content answers. You can configure a custom content response to include a graphic as in the following example:

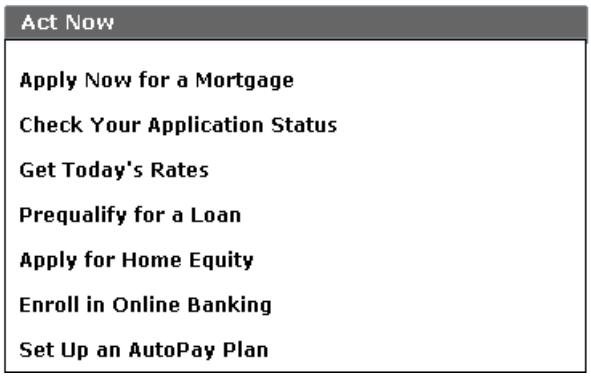


See *Intents, Intent Hierarchies, Intent Responses* in the *Intelligent Search Language Tuning Guide* for more information on configuring custom content responses.

Act Now Portlet Example

The Act Now portlet is intended to provide quick access to relevant activities that users can perform on your site. Opening an account, registering for a service, and checking the status of an order are examples of actions that you can configure as Act Now responses.

The Act Now portlet can display responses generated by any of the available answer methods; however, it is well-suited to present custom content answers that specify a title as a link to the desired location, as in the following example:



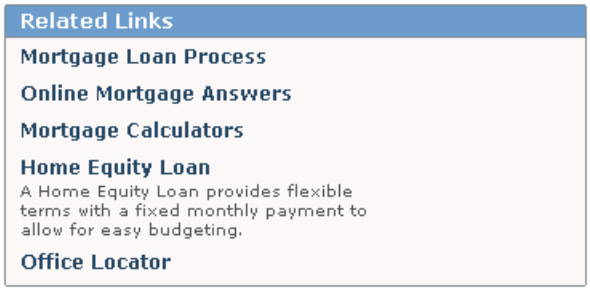
See *Intents, Intent Hierarchies, Intent Responses* in the *Intelligent Search Language Tuning Guide* for more information on configuring custom content responses.

Learn More Portlet Example

The Learn More portlet is intended to provide access to related topic areas and site features. You can use the Learn More portlet to direct users to FAQ pages, process overview pages, tools and calculators, and other site resources.

The Learn More portlet can display responses generated by any of the available answer methods. It is well-suited to present:

- Custom content answers that specify a title as a link to the desired location
- Custom content responses that include additional descriptive text, as in the following example:



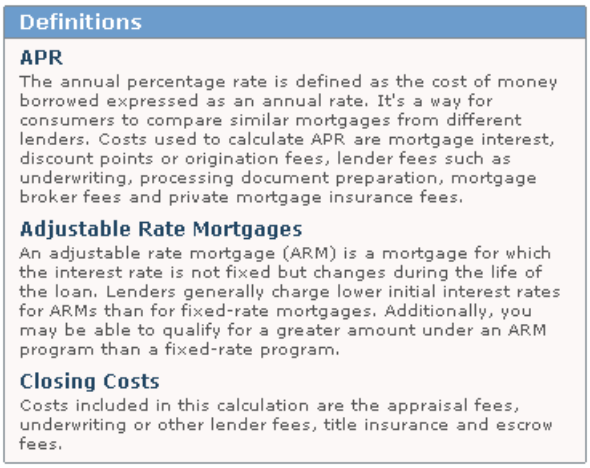
See *Intents, Intent Hierarchies, Intent Responses* in the *Intelligent Search Language Tuning Guide* for more information on configuring custom content responses.

Definition Portlet Example

The Definitions portlet is intended to present glossary information that may or may not be accessible on the site. InQuira 8.1 uses a special Dictionary component called an alias list to store glossary information for use by the application. The application then generates a Definitions response whenever a configured glossary term occurs in a question.

The default Definitions portlet displays the glossary term as a link that users can click to display the associated definition on a separate answer page.

The Definitions portlet is recommended for use with the Glossary answer purpose as in the following example:

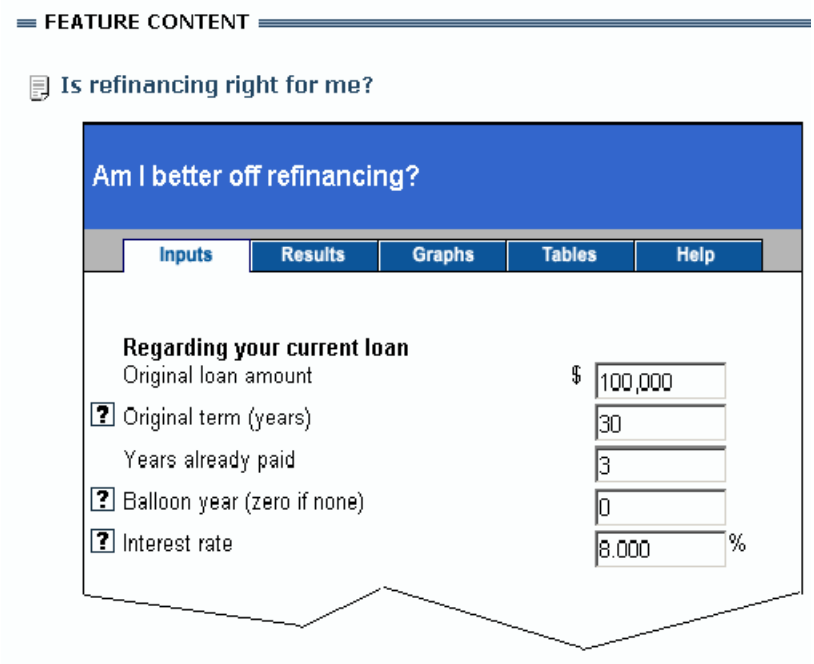


See *Glossary Answer Action Method* in the *Intelligent Search Optimization Guide* for more information on accessing glossary information.

Feature Content Portlet Example

The Feature Content portlet is intended to direct users to site features and resources. The Feature Content portlet is similar in intent to the Learn More portlet; however, the default User Interface displays Feature Content responses inline with the standard answers, enabling more information to be displayed for each response.

The Feature Content portlet can display responses generated by any of the available answer methods; however, it is well-suited to present custom content answers that include HTML-based functionality, as in the following example:



Chapter 4 Customizing the User Interface

The basic customization tasks for integrating the User Interface include:

- Specifying the layout style within the main template
- Customizing common elements, such as fonts, background colors, and graphic images, as described in *Customizing Style Elements* on page 36
- Customizing request and response elements, as described in *Customizing Request Elements* on page 43 and *Customizing Response Elements* on page 46
- Implementing optional features, as described in *Implementing Optional Features* on page 55.

Specifying the User Interface Layout

You specify the layout of the User Interface by specifying one of the global templates available in the extensible style language (xsl) file `main.xsl`, located in:

int/xsl/search/main.xsl

The `main.xsl` file contains include statements for the basic search layout and the additional personalized navigation and virtual representative features. Each include statement refers to one of the available global templates:

Layout Style	Description
ui_search_basic.xsl	Specifies the basic User Interface layout. This statement is enabled by default.
ui_search_and_browse.xsl	Specifies to display the Personalized Navigation user interface elements as described in *Activating the Personalized Navigation User Interface Layout* on page 59.
ui_search_vrep.xsl	Specifies to display the virtual representative user interface elements as described in *Implementing a Virtual Representative* on page 63.

IMPORTANT: You can enable only one of the include statements for your application.

The following example shows the default implementation, which enables the basic search layout, `ui_search_basic.xsl`:

```
<!-- Options for Search UI Main Screens -->
<xsl:import href="ui_search_basic.xsl"/>
<!--xsl:import href="ui_search_and_browse.xsl"/-->
<!--xsl:import href="ui_search_vrep.xsl"/-->
```

Integrating the User Interface

To integrate the InQuira 8.1 User Interface with your web site, you need to

- Integrate standard elements from your site, such as navigation and graphics, into the selected layout template
- Reference the URL of the installed and customized User Interface layout template from the appropriate locations within your site pages, such as search boxes and relevant navigation links

Customizing Style Elements

You can customize style elements of the User Interface, such as fonts, background colors, and margins, by modifying the values contained in the User Interface stylesheet, `qna_style.css`. The stylesheet defines presentation for general elements used in multiple locations, and sets of related elements, as described in:

- *Customizing General Style Elements* on page 36
- *Customizing Question Area Definitions* on page 38
- *Customizing Answer Area Definitions* on page 39
- *Customizing Sidebar Area Definitions* on page 41

Customizing General Style Elements

The general style elements determine style and formatting of various elements used throughout the user interface.

Element Name	Description

qna-page-body	This element defines the properties for the HTML <body> element of the page. It establishes general settings for relative font size, font type, page color, and page margins by default.
qna-normal-text	This element defines generic properties for a variety of text on the page. It establishes font type and relative font size.
qna-small-text	This element defines generic properties for a variety of text on the page, similar to <qna-normal-text>. It establishes font type and relative font size for text elements intended to be a little smaller than normal, such as the text just above the question box.
qna-input-textarea	This element defines properties for the HTML <textarea> object used for the question box. It establishes font type, relative font size, and scrolling properties.
qna-input-button	This element defines properties for HTML form buttons on the page. By default, it sets the font type, size and color as well as the button color.
qna-header	This element defines properties for the question box and top ten questions header bars on the main search page. It sets the font type, weight, and color, as well as the background color of the header bar.
qna-header-side	This element defines properties for headers in the left sidebar when using the question_and_results_side.xsl template, similar to the <qna-header> element.
qna-field-label	This element defines properties for the label next to the question box. By default, it sets the alignment to the top-right of its table cell.
qna-help-link	This element defines properties for the link to the help (Tips) page located near the question box. It sets the font type, size, color and alignment within its area.
qna-radio-link	This element defines properties for the links around the user feedback options. It sets the font type and color, alignment within its area, and underline properties to distinguish the options from hyperlinks.
qna-similar-link	This element defines properties for the link text to similar answers. It sets the font type and color by default.
qna-link	This element defines properties for general purpose link objects such as the paging links. It sets the font type, color, and alignment.
qna-area-separator	This element defines properties for any lines used to separate major sections of the User Interface. By default, it is used to draw the line between the results and the site navigation. It is primarily used in the main User Interface integration files such as question_and_results.xsl and only defines a background color by default.
qna-area-separator-dark	Same as <qna-area-separator>, but used for a second level of separation in some cases, such as between results and the sidebar.
qna-header-separator	This element defines properties for the lines around header bars such as the question box on the main search page. It only defines the color of those lines by default.

qna-footer-separator	This element defines properties for the separator line at the bottom of a results page. It only defines the color of that line by default.

Customizing Question Area Definitions

The question area elements determine style and formatting of various elements used within the User Interface question area.

Element Name	Description
qna-question-header	This element defines properties for the question box header bar that is used when shown at the top of the results list. It sets the font type, relative size and color.
qna-question-sidebar-header	This element defines properties for the question box header bar that is used when shown in the left sidebar. Similar to <qna-question-header>.
qna-question-label	This element defines properties for the label next to the repeated question on the page. It specifies the font type, weight, relative size, color and alignment. The default label text is: You Asked.
qna-question-text	This element defines properties for the repeated question on the page. It sets the font type, weight, relative size and color.
qna-question-sidebar-label	This element defines properties for the label next to the repeated question when shown in the left sidebar (using question_and_results_side.xsl). Similar to <qna-question-label>.
qna-question-sidebar-text	This element defines properties for the repeated question when shown in the left sidebar area (using question_and_results_side.xsl). Same as <qna-question-text>.
qna-question-sidebar-block	This element defines properties for the area where the question is repeated when using the three column layout (question_and_results_side.xsl). By default, it sets the background color for the area.
qna-dialog-text-question-label	This element defines properties for the label identifying the user's question when using the virtual representative interaction. By default, it sets the font family, size, weight, alignment and color for the label.
qna-dialog-text-question	This element defines properties for the user's question when using the virtual representative interaction. By default, it sets the font family, size, alignment and color for the text.
qna-dialog-text-answer-label	This element defines properties for the label identifying a virtual representative's response to the user. By default, it sets the font family, size, and weight.

qna-dialog-text-answer	This element defines properties for a virtual representative's response to the user. By default, it sets the font family, size, alignment and color for the text.
qna-dialog-sidebar-answer-label	This element defines properties for the label identifying a virtual representative's response to the user for answer labels displayed in the sidebar when using the three-column layout. Similar to `<qna-dialog-text-answer-label>`.
qna-dialog-sidebar-answer-text	This element defines properties for a virtual representative's response to the user for answers displayed in the sidebar area when using the three-column layout. Similar to `<qna-dialog-text-answer>`.
qna-dialog-image-border	This element defines properties for the border around a virtual representative's image on the screen. By default, it defines the color of the border.
qna-dialog-border	This element defines properties for the border around the text dialog between the virtual representative and the user on the screen. By default, it defines the color of the border.
qna-dialog-block	This element defines properties for the area containing the text dialog between the virtual representative and the user on the screen. By default, it defines the background color and padding for the area.
qna-example-label	This element defines properties for the label next to the question example text. By default, it defines the font family, size, color and alignment.
qna-example-label-above	This element defines properties for the label next to the question example text when it appears above the example text. By default, it defines the font family, size, color and alignment.
qna-example-text	This element defines properties for the question example text. By default, it defines the font family, size, and color.

Customizing Answer Area Definitions

The answer area elements determine style and formatting of various elements used within the User Interface answer area.

Element Name	Description
qna-result-section-header	This element defines properties for the header of each section of results (best answers, possible answers, featured content). By default, it defines the font family, weight, size, color, and alignment.
qna-result-text	This element defines high level properties for "best" answers. By default, it defines the font family, size, and alignment.
qna-result-text-small	This element defines high level properties for regular answers. By default, it defines the font family, size, and alignment.

qna-result-bar	This element defines properties for the area of the results list containing general headers and other controls. By default, it defines the font family, weight, size, and alignment.
qna-result-bar-disabled	This element defines properties for the area of the results list containing disabled controls. By default, it defines the font color.
qna-result-marker	This element defines properties for the marker identifying the beginning of an answer. By default, the marker is a document icon, but the style defines the font type, weight, size and alignment in case text elements are to be used.
qna-more-result-marker	This element defines properties for the marker identifying the more results link when shown between best and possible answers. By default, it defines the font type, weight, size, color and alignment.
qna-standard-subject	This element defines properties for the answer title. By default, it defines the font type, weight and color.
qna-standard-more-link	This element defines properties for the `more` link to the answer (if used in the design). By default, it defines the font type, weight, size, and color.
qna-standard-excerpt-block	This element defines general properties for the answer excerpt. By default, it defines the font type, size, and color, as well as spacing for the block.
qna-snippet-sentence-text	This element defines properties for the sentence in the answer excerpt that matched the user's question. By default, it defines the font size, weight, color, and background color.
qna-secondary-snippet-text	This element defines properties for the secondary word matches in the answer excerpt. By default, it defines the font size, weight, color, and background color.
qna-snippet-text	This element defines properties for the primary word matches in the answer excerpt. By default, it defines the font size, weight, color, and background color.
qna-standard-table-block	This element defines properties for the structured table display area. By default, it defines the font type, size, and color, as well as margins for the area.
qna-standard-source-block	This element is intended to define properties for text displaying the source URL of the answer. By default, the source is not shown. This definition sets a font type, size, style, and color as well as margins for the display block.
qna-standard-link-block	This element is used to define properties for useful links following the answer excerpt such as "similar answers". By default, the source is not shown. This definition sets a font type, size, and color as well as margins for the block.
qna-standard-sentence-block	This element defines properties for simple sentence answers such as managed answers that display custom content. By default, it defines the font type, size, and color, as well as margins for the block.

qna-exact-excerpt-block	This element defines properties for specially identified “exact” excerpts. In a default implementation, this is only applicable to exact answer definitions. By default, it defines the font type, size, and color as well as margins, padding and borders for the block.
qna-result-table	This element defines properties for the main table definition of a structured answer. By default, it defines the border style and color.
qna-result-table-header	This element defines properties for the column headers of a structured answer. By default, it defines the font type, weight, size, and color in addition to the border style and color.
qna-result-table-text	This element defines properties for a data cell of a structured answer table. By default, it defines the font type, weight, size, and color in addition to the border style and color.
qna-result-table-more	This element defines properties for the link to the entire table of a structured answer when displaying as a summary (usually in an answer list). By default, it defines the font type, weight, size, alignment, and color in addition to the border style and color.

Customizing Sidebar Area Definitions

The answer area elements determine style and formatting of various elements used within the User Interface answer area.

Element Name	Description
qna-sidebar-block	This element defines general properties for the area of the screen where the sidebar is to be displayed. By default, it defines the background color.
qna-sidebar-section-border	This element defines properties for the border around the sidebar area and/or individual components. By default, it defines the background color.
qna-sidebar-section-title	This element defines properties for the title area of a sidebar component. By default, it defines the font type, weight, size, and color as well as the background color for the title area.
qna-sidebar-section	This element generally defines properties for the content area of a sidebar component. By default, it defines the font type, size, alignment and color as well as the background color for the area.
qna-sidebar-section-center	This element defines properties for the content area of a sidebar component, similar to `<qna-sidebar-section>`, except that the content area is centered. By default, this is only used by the user feedback module.
qna-sidebar-subject	This element defines properties for answer titles within a sidebar component. By default, it defines the font type, weight and color. Similar to `<qna-standard-subject>`.

qna-sidebar-more-link	This element defines properties for the `more` link to the answer in a regular sidebar component (if used in the design). By default, it defines the font type, weight, size, and color. Similar to `<qna-standard-more-link>`.
qna-sidebar-excerpt-block	This element defines general properties for answer excerpts displayed in a regular sidebar component. By default, it defines the font type, size, and color, as well as spacing for the block. Similar to `<qna-standard-excerpt-block>`.
qna-sidebar-table-block	This element defines properties for structured table display areas within sidebar components. By default, it defines the font type, size, and color, as well as margins for the area. Similar to `<qna-standard-table-block>`.
qna-sidebar-source-block	This element is defines properties for text displaying the source URL of answers within sidebar components. By default, the source is not shown. This definition sets a font type, size, style, and color, as well as margins for the display block. Similar to `<qna-standard-source-block>`.
qna-sidebar-sentence-block	This element defines properties for simple sentence answers, such as managed answers that display custom content, within sidebar component. By default, it defines the font type, size, and color, as well as margins for the block. Similar to `<qna-standard-sentence-block>`.
qna-strong-sidebar-section-border	This element defines properties for a highlighted border around the sidebar area and/or individual components. Similar to `<qna-sidebar-section-border>`.
qna-strong-sidebar-section-title	This element defines properties for a highlighted title area of a sidebar component. Similar to `<qna-sidebar-section-title>`.
qna-strong-sidebar-section	This element defines properties for a highlighted content area of a sidebar component. Similar to `<qna-sidebar-section>`.
qna-strong-sidebar-section-center	This element defines properties for a highlighted content area of a sidebar component, similar to `<qna-sidebar-section>`, except that the content area is centered.
qna-strong-sidebar-subject	This element defines properties for highlighted answer titles within a sidebar component. Similar to `<qna-sidebar-subject>`.
qna-strong-sidebar-more-link	This element defines properties for a highlighted `more` link within a sidebar component. Similar to `<qna-sidebar-more-link>`.
qna-strong-sidebar-excerpt-block	This element defines general properties for highlighted answer excerpts displayed in a sidebar component.Similar to `<qna-sidebar-excerpt-block>`.
qna-strong-sidebar-table-block	This element defines properties for highlighted structured table display areas within sidebar components. Similar to `<qna-sidebar-table-block>`.

qna-strong-sidebar-source-block	This element is defines properties for text displaying highlighted answer source URLs within sidebar components. Similar to <qna-sidebar-source-block>.
qna-strong-sidebar-sentence-block	This element defines properties for highlighted simple sentence answers, such as managed answers that display custom content, within sidebar components. Similar to <qna-sidebar-sentence-block>.

Customizing Request Elements

The User Interface request area contains the following elements, each of which has one or more configurable properties, as described in the following sections:

- *Customizing the Request Heading* on page 44
- *Customizing the Question Box* on page 45
- *Customizing the Tips Link* on page 45
- *Customizing the Submit Button* on page 45

Customizing the Request Heading

The request heading contains the following configurable properties:

Property	Template	Element Name	Default Value
question area header	`config.xsl`	question-area-label question-sidebar-area-header	Ask a Question Ask Another Question
text to display above the question box	`config.xsl`	question-box-header	Have a question? Type it below to find an answer now.
font characteristics	`qna_style.css`	qna-question-*	See *Customizing Question Area Definitions* on page 38

Customizing the Example Question

The example question contains the following configurable properties:

Property	Template	Element Name	Default Value
text to display below the request heading	`config.xsl`	question-example	"Does Product X have Feature Y?"
font characteristics	`qna_style.css`	qna-question-*	See *Customizing Question Area Definitions* on page 38

Customizing the Question Box

The question box has the following configurable properties:

Property	Template	Element Name
box size	`question.xsl` `question_side.xsl`	question-top question-side question-sidebar
boundary characteristics	`question.xsl` `question_side.xsl`	question-top question-side question-sidebar

Customizing the Tips Link

The Tips link has the following configurable properties:

Property	Template	Element Name	Default Value
text to display	`question.xsl`	tips-link	Tips
font characteristics	`qna_style.css`	qna-help-link	See *Customizing Question Area Definitions* on page 38

Customizing the Submit Button

The Submit button has the following configurable properties:

Property	Template Location	Element Name	Default Value
text to display	`question.xsl` `question_side.xsl`	question-top question-side question-sidebar	Ask
font characteristics	`qna_style.css`	qna-input-button	See *Customizing Question Area Definitions* on page 38

Customizing Response Elements

The User Interface response page contains the answer area and the related information (portlet) area. The answer area contains the following elements, each of which has one or more configurable properties, as described in the following sections:

- *Customizing the Question Echo* on page 46
- *Customizing the Answer Introduction* on page 47
- *Customizing Answer Headings* on page 47
- *Customizing the Answer Body Text* on page 47
- *Customizing the Answer Document Link* on page 48

See for information on customizing elements in the related information area.

Customizing the Question Echo

The question echo contains the following configurable properties:

Property	Template	Element Name	Default Value
echo prefix	`config.xsl`	question-paraphrase-label	You Asked:
font characteristics	`qna_style.css`	qna-question-label qna-question-text	See *Customizing Question Area Definitions* on page 38

Customizing the Answer Introduction

The answer introduction contains the following configurable properties:

Property	Template	Element Name	Default Value
text to display as heading for highest scoring answers	`config.xsl`	best-answers-header	Best Answers
text to display as heading for additional good answers	`config.xsl`	good-answers-header	Answers
font characteristics	`qna-style.css`	qna-result-section-header	See *Customizing Question Area Definitions* on page 38

Customizing Answer Headings

The headings or titles for standard answer displays contain the following configurable properties:

Property	Template	Element Name	Default Value
font characteristics	`qna_style.css`	qna-result-section-header	See *Customizing Question Area Definitions* on page 38

Customizing the Answer Body Text

The text of standard answer displays contain the following configurable properties:

Property	Template	Element Name	Default Value
font characteristics	`qna_style.css`	qna-result-text	See *Customizing Question Area Definitions* on page 38

Customizing the Answer Document Link

The link to the document that contains the answer for standard answers has the following configurable properties:

Property	Template	Element Name	Default Value
document icon	`results.xsl`	answer-marker	document type-dependent, as described in *Answer Display Features* on page 25
display or not	`results.xsl`	answer-block	Display
display text	`results.xsl`	answer-block	more
font characteristics	`qna_style.css`	qna-*-more-link	See *Customizing Question Area Definitions* on page 38

Configuring Answer Purposes

The InQuira 8.1 Personalized Response User Interface is installed with a defined set of answer purposes, which are mapped to a default set of portlets, as described in *Default Answer Purposes* on page 27. You can also add custom answer purposes to meet specific implementation requirements.

You configure answer purposes by:

- Customizing portlet presentation, as described in *Customizing Answer Portlets* on page 52
- (Optional) Adding answer purposes to the application, as described in *Adding Answer Purposes to the Application* on page 49

NOTE: Your application may include additional industry- or domain-specific answer purposes. For more information about domain-specific answer purposes, contact your InQuira account representative.

Adding Answer Purposes to the Application

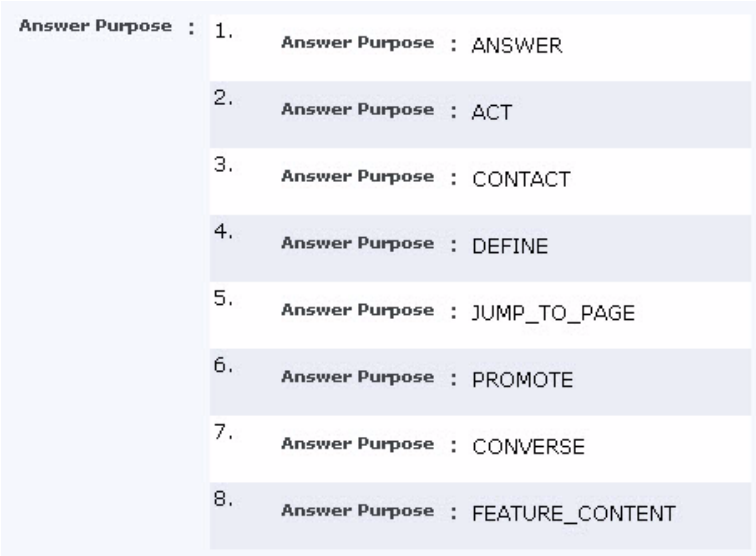
You can add and modify answer purposes in the application configuration on the Dictionary Service page of the Instances section of the Advanced Configuration Facility.

When you configure a new answer purpose, the new purpose is available to Dictionary Manager users in the Purpose drop-down menu of the Rule window.

To define or modify an answer purpose:

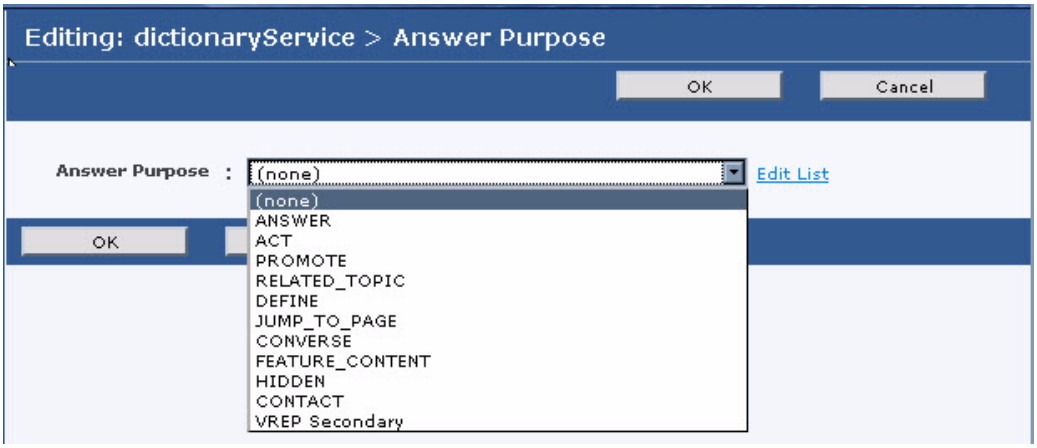
1. Select **Dictionary** from the Advanced Configuration Facility main menu.

   The Answer Purpose section of the Dictionary Service page displays the currently defined answer purposes:



2. Click **Edit**.
3. Click **Add New Item** below the Answer Purpose list.

   The Answer Purpose selection list displays.

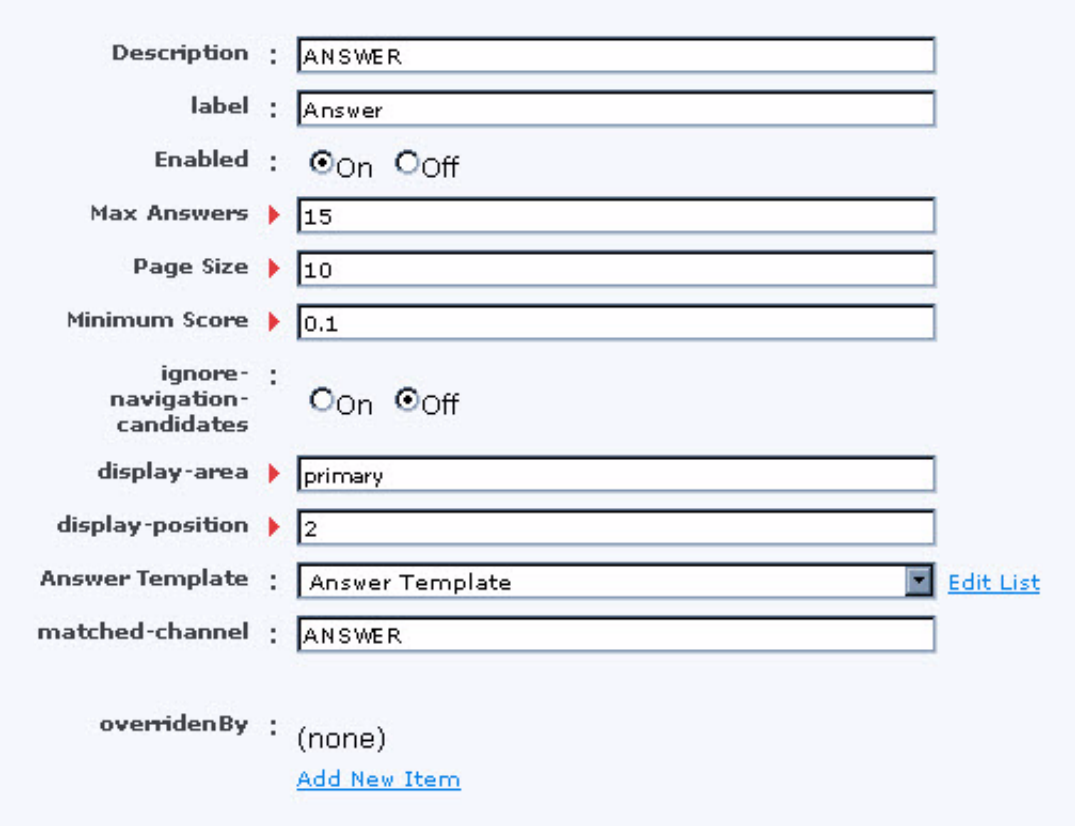


4. Select **Edit List**

   The Answer Purpose list displays.

5. Click an existing purpose to edit properties, or click **Add New Item** below the Answer Purpose list to create a new purpose.

   The Answer Purpose page displays. The following example shows the default settings for the Answer purpose:



6. Specify the following answer purpose parameters:

Parameter	Description
Description	Specify the name of the answer purpose. The name can be any alphanumeric string. Spaces and punctuation are not allowed. When the purpose is defined and enabled, this name displays in the Purpose drop-down menu of the Rule window.
Label	Specify the text to display as the portlet heading in the User Interface.
Enabled	Select On to enable this purpose. Only enabled purposes is available in the Dictionary Manager and processed by the Rules Engine and User Interface components. The default value is On. NOTE: Existing rules that specify purposes that are not enabled are processed using the Answer purpose.
Maximum Answers	Specify the maximum number of answers having this purpose to display on the response page for a given question.
Page Size	Specify the maximum number of answers having this purpose to display on the initial response page.
Minimum Score	Specify the minimum score that answers having this purpose must obtain to display on the response page for a given question. See the **Intelligent Search Language Developers' Guide* for more information on response scoring.
Ignore Navigation Candidates	Specify whether answers having this purpose contribute to the answer totals maintained by the Personalized Navigation feature.
display-area	Specify the area of the page where the response should appear.
display-position	Specify the display position within the area. Enter a numeric value of 1-10.
Answer Template	Select an answer template from the drop-down menu to use when creating a new response.
matched-channel	Optionally, specify a channel to associate with this purpose.
Overriden By	Specify any answer purposes such that answers returned for the specified purposes are not repeated in the display for this purpose.

7. Click **OK** to save the new or modified answer purpose.

Customizing Answer Portlets

Each answer purpose that you define for your application is displayed in a separate portlet that has the following configurable elements:

- Portlet display position as described in *Specifying Portlet Display Position* on page 52.
- Portlet headings as described in *Customizing Portlet Headings* on page 52
- portlet answers as described in *Customizing Portlet Answer Text* on page 53
- portlet document links as described in *Customizing Portlet Document Links* on page 53

Specifying Portlet Display Position

To specify the order in which the portlets appear on the response page, arrange the order of the portlet definition sections in the `sidebar.xsl` template. Each definition section corresponds to a defined portlet. Portlets that are disabled, or for which there are no defined Rules in the Dictionary, do not display on the response page.

Sample Portlet Display Area Template provides a sample of the contents of the portlet definitions.

Customizing Portlet Headings

The answer portlet headings have the following configurable properties:

Property	Template	Element Name	Default Value
heading text	`config.xsl`	*-answers-header	See *Default Answer Purposes* on page 27
font characteristics	`qna_style.css`	qna-(strong-)sidebar-*	See *Customizing Sidebar Area Definitions* on page 41
background color	`qna_style.css`	qna-(strong-)sidebar-*	See *Customizing Sidebar Area Definitions* on page 41

Customizing Portlet Answer Headings

The answer headings within portlets contain the following configurable properties:

Property	Template	Element Name	Default Value
font characteristics	`qna_style.css`	qna-(strong-)sidebar-*	See *Customizing Sidebar Area Definitions* on page 41

Customizing Portlet Answer Text

The answer text within portlets contain the following configurable properties:

Property	Template	Element Name	Default Value
font characteristics	`qna_style.css`	qna-(strong-)sidebar-excerpt-block	See *Customizing Sidebar Area Definitions* on page 41

Customizing Portlet Document Links

The link to the document that contains the answer for portlet answers has the following configurable properties:

Property	Template	Element Name	Default Value
display or not	`results.xsl`	answer-block	Display
display text	`results.xsl`	answer-block	More
font characteristics	`qna_style.css`	qna-*-more-link	See *Customizing Sidebar Area Definitions* on page 41

Chapter 5 Implementing Optional Features

The User Interface default configuration implements the standard request and response features. You can configure the User Interface to implement the following optional features:

- Process Wizards as described in *The Process Wizard User Interface* on page 56
- Personalized Navigation as described in *Activating the Personalized Navigation User Interface Layout* on page 59
- Direct page display for specified answers as described in *Implementing Direct Page Display* on page 61
- Virtual representative (VREP) dialog support as described *Implementing a Virtual Representative* on page 63
- Answer quality user feedback collection as described in *Implementing User Feedback Collection* on page 63
- Click-through logging as described in *Implementing Click-Through Logging* on page 70
- Answer highlighting within answer documents as described in *Highlighting Answers Within Documents* on page 71
- Non-English text elements as described in *Managing Multiple Languages in the User Interface* on page 75

NOTE: You can also configure the User Interface to display answers from configured Siebel 7 applications. For more information on integrating Siebel 7 applications with InQuira 8.1, see the **Intelligent Search Siebel Integration Guide*, or contact your InQuira account representative.

The Process Wizard User Interface

The Process Wizard User Interface is a set of specific pages designed for use with Process Wizards. When users select an Process Wizard answer from the standard answer page, the User Interface invokes the Process Wizard User Interface pages to display the selected Process Wizard.

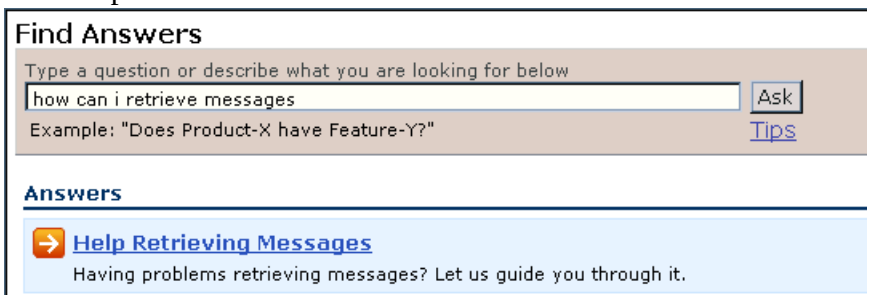
NOTE: The Process Wizard User Interface is automatically configured for use within the standard User Interface.

The Process Wizard User Interface consists of the following major elements:

- The Process Wizard answer, which displays on the answer page as described in *The Process Wizard Answer* on page 56
- The step display area, which contains the steps defined for the process, as well as the navigation buttons (Back, Next, Finish) as described in *The Step Display Area* on page 57
- The process summary column, which displays information about the previous steps that the user has taken to progress through the wizard as described in *The Step Display Area* on page 57

The Process Wizard Answer

When an end-user submits a request to the application that matches a process wizard rule, the User Interface displays a special Process Wizard answer in the standard answer area, for example:



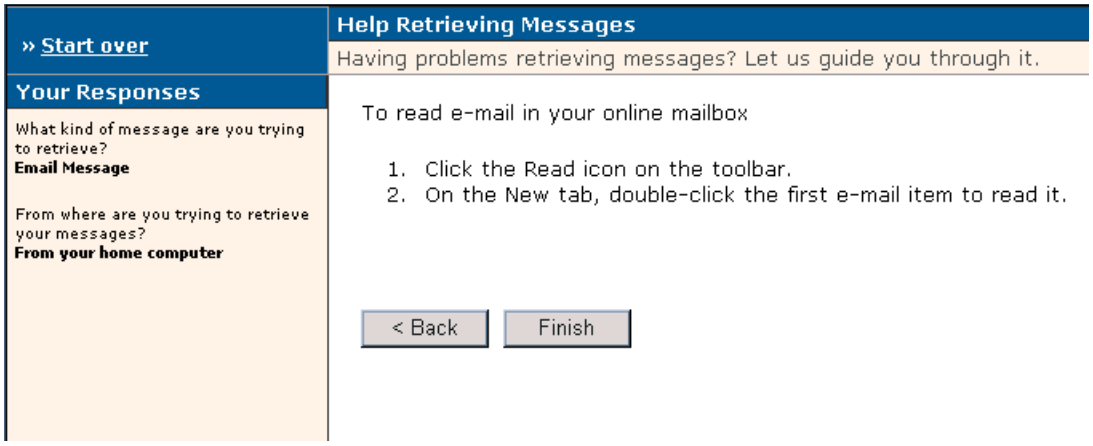
If users select the link in the process wizard answer, the User Interface displays the initial step of the process wizard.

The Step Display Area

When users select a Process Wizard answer, the application displays the initial step in the Process Wizard User Interface step display area.

The Process Wizard User Interface displays a summary of the user's previous responses to the left of the step display area. The summary displays below the heading **Your Responses**.

Each response is displayed as a link that navigates back to the process step.



Modifying the Process Wizard User Interface

You can modify Process Wizard User Interface elements to suit the needs of your application by editing the Process Wizard User Interface files, located in one of the following locations:

<InQuira_root>/inquira/int/<subdirectory>

where:

`<subdirectory>` is one of the following:

- css
- js
- xsl/search

CSS Files	Description
`qna_wizard_style.css`	This is the style sheet that specifies the style and formatting for the elements that are specific to the Process Wizard User Interface and are not part of the standard search.

Java Script Files	Description
`qna_wizard.js`	This is a JavaScript library that contains Process Wizard User Interface-specific functionality.

XSL Files	Description
`wizard.xsl`	This is the main Process Wizard User Interface file that contains the basic page definition (similar to the `ui_search*.xsl` files) and utilities for the wizard pages.
`wizard_fields.xsl`	This file contains all of the templates used to render any defined wizard fields such as radio buttons, text boxes, select boxes, HTML areas, etc. on the UI.
`wizard_history.xsl`	This file contains the templates for displaying the user's choice history as well as the support templates for any actions generated by the history information such as links back to previous pages.

NOTE: The file `int/xsl/process_wizard/step.xsl` is used only for previewing steps in the Process Wizard Editor, and is not used in the Process Wizard User Interface.

Activating the Personalized Navigation User Interface Layout

To implement the Personalized Navigation User Interface elements, you activate the Personalized Navigation User Interface layout, `ui_search_and_browse.xsl`, located in:

int/xsl/search/main.xsl

The `main.xsl` file contains an include statement for the Personalized Navigation User Interface layout.

The following is an example of the include statements within the `main.xsl` file, showing the Personalized Navigation layout enabled:

```
<!-- Options for Search UI Main Screens -->
<!--xsl:import href="ui_search_basic.xsl"/-->
<xsl:import href="ui_search_and_browse.xsl"/>
<!--xsl:import href="ui_search_vrep.xsl"/-->
```

IMPORTANT: You can enable only one of the include statements for your application.

The Personalized Navigation User Interface Elements

The User Interface uses various elements to display Personalized Navigation content categories:

- Style elements, as described in *Personalized Navigation XSL Style Sheet Elements* on page 60 and *Personalized Navigation CSS Style Sheet Elements* on page 60
- Resource elements as described in *Personalized Navigation-Related XML Elements* on page 61.

Personalized Navigation XSL Style Sheet Elements

The User Interface XSL style sheets are located in:

<InQuira_home>/int/xsl/search

XSL Style Sheet	Description
ui_search_and_ browse.xsl	This file is one of the main templates that determine the layout of the User Interface elements, including the question box, browse bar, answers, and sidebar. It is one of three main templates that you choose among as part of the basic User Interface implementation process as described in *Specifying the User Interface Layout* on page 35.
browse_bar.xsl	This file contains the templates that render the contents of the facet navigation browse bar.
facet_table.xsl	This file contains the templates for displaying an entire table of values in response to selecting the **More...** link in the browse bar for categories that contain a large number of items. The More link displays a page containing all of the items.
question_browse .xsl	This file contains the definition for the question-top template used with Personalized Navigation, which differs from the standard User Interface question area.
results.xsl	This file contains updates to the standard answer block template to support facet label display within the answer section.

Personalized Navigation CSS Style Sheet Elements

The User Interface CSS style sheet is located in:

<InQuira_home>/int/css

CSS Style Sheet	Description
qna_style.css	This is the standard CSS for the User Interface. It contains new elements to support Personalized Navigation, primarily in the section labeled `Browse Area Definitions`. Additional Personalized Navigation-related definitions can be found by searching for `facet` in this file.

Personalized Navigation-Related XML Elements

The User Interface-related XML resources are located in:

<InQuira_home>/int/search

XML File	Description
resource.xml	This is the standard XML resource file, which contains new text elements and definitions. Personalized Navigation-related definitions begin with the term `facet-`.

Implementing Direct Page Display

The direct page display feature specifies direct display of the document that contains the best answer within a modified version of the response page.

The direct page display template defines an alternate response page that displays the relevant document contents in the area that the answer section would normally occupy.

The components of direct page display include:

- The Jump to Page answer purpose
- The direct page display template

You implement the direct page display feature by assigning the Jump to Page answer purpose to the appropriate Rule in the Dictionary as described in *Rules* in the *Intelligent Search Language Tuning Guide*.

Direct Page Display Example

The direct page display layout provides direct access to the best answer for a specified question in lieu of the standard answer display. The following example shows direct page display within a three-column layout style.

Implementing a Virtual Representative

You can configure InQuira 8.1 for virtual representative (VREP) applications. To configure an InQuira 8.1 application for use with a VREP, you need to:

- Make an image library for your VREP available to the application
- Create appropriate Dictionary rules using the Dialog answer purpose, as described in the *Rules* in the *Intelligent Search Language Tuning Guide*.
- Associate appropriate images from the library with the configured Dialog answers
- Enable the virtual representative user interface layout

The User Interface contains a dialog-style layout template, `ui_search_vrep.xsl`, located in:

```
inquira/int/xsl/search/
```

The `main.xsl` file contains an include statement for the virtual representative user interface layout. To enable the virtual representative user interface layout, activate the xsl import statement. The following is an example of the layout include statements showing the virtual representative layout enabled:

```
<!-- Options for Search UI Main Screens -->
<!--xsl:import href="ui_search_basic.xsl"/-->
<!--xsl:import href="ui_search_and_browse.xsl"/-->
<xsl:import href="ui_search_vrep.xsl"/>
```

IMPORTANT: You can enable only one of the include statements for your application.

Implementing User Feedback Collection

You can collect information from customers about their satisfaction with the answers provided by the application through the user feedback feature of the response page. The user feedback mechanism consists of two components:

- The user feedback portlet as described in *The User Feedback Portlet* on page 64
- The user feedback comment page as described in *The User Feedback Comment Form* on page 65

The user feedback feature is configured by default to display in the related information area of the response page. You can disable the user feedback mechanism as described in *Disabling the User Feedback Feature* on page 69.

The User Feedback Portlet

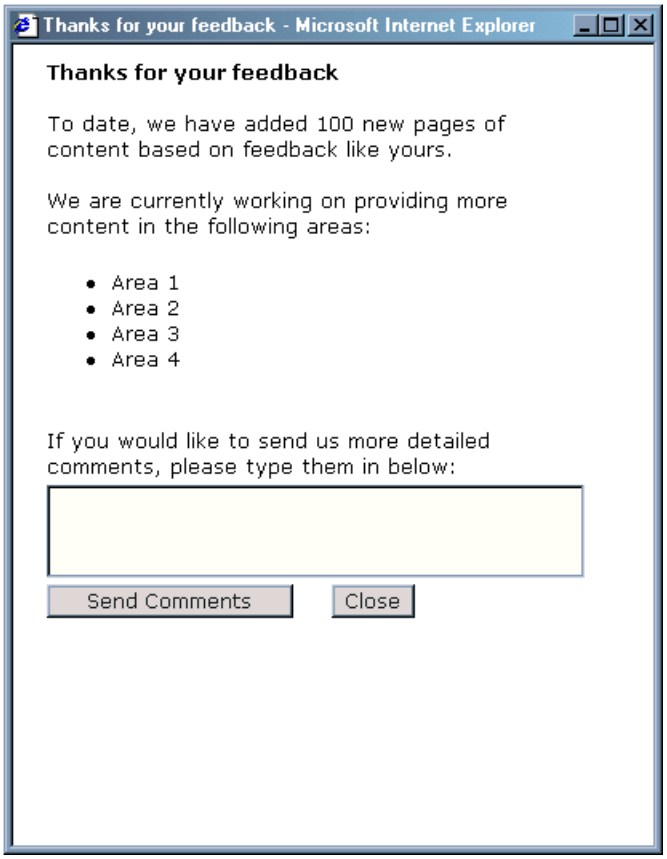
The user feedback portlet displays by default in the related information area of the response page.

It contains the following elements that you can customize for your application:

- The user feedback heading, as described in *Customizing the User Feedback Area Heading* on page 67
- The rating labels, as described in *Customizing the User Feedback Rating Labels* on page 68

The User Feedback Comment Form

The user feedback comment form displays by default in when users submit feedback to the application.



The comment form provides space for users to enter additional comments. User-supplied comments are maintained in the application logs, and are available to the optional InQuira Analytics application's User Feedback report.

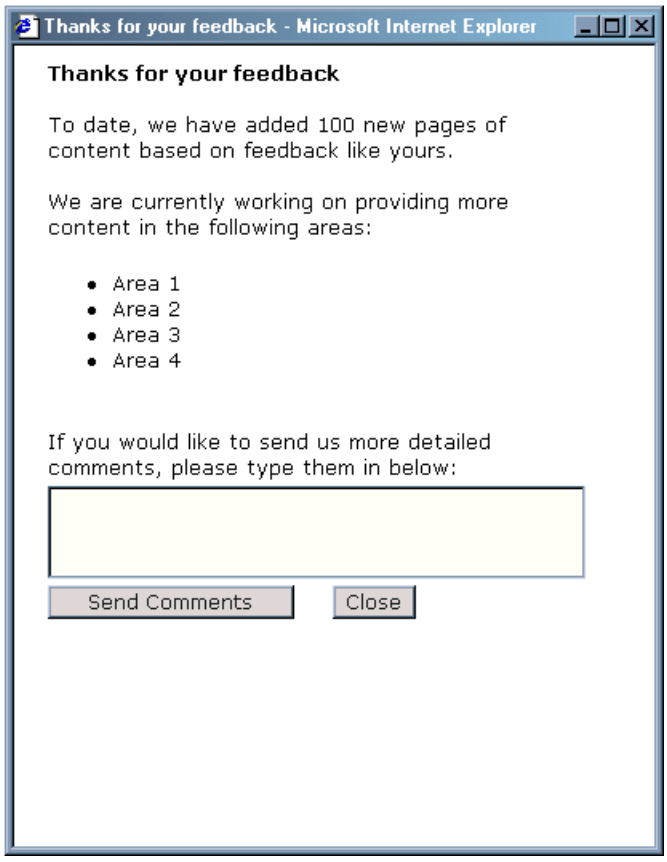
See *Using InQuira Analytics* for more information on the User Feedback report.

IMPORTANT: The default user feedback form contains sample content that is intended to be customized for your application.

The User Feedback Process

The user feedback process begins on the standard results page. The user feedback portlet solicits optional input from users. Users enter feedback by selecting from a list of radio buttons that correspond to the rating levels described in *Customizing the User Feedback Rating Labels* on page 68.

When users submit the rating selection, the application displays the user feedback form, which must be customized for your application as described in *Customizing the User Feedback Comment Form* on page 69. Users can enter additional feedback as text, or choose to close the feedback form.



The application logs both the rating level and any optional text as a message having the identifier `ANALYTICS_USER_FEEDBACK`. The optional InQuira Analytics application uses these messages to populate the User Feedback report.

Customizing the User Feedback Area Heading

You can customize the user feedback heading by editing the value specified in the User Interface resource file, `<InQuira_home>/inquira/int/xsl/search/resource.xml`.

The `resource.xml` file is divided into sections that correspond to functional areas within the User Interface.

To modify the user feedback heading:

- Locate the user feedback section, which is indicated by the label:

```
User feedback modules / screens
```

- Locate the parameter `user-feedback-header`

```
<term id="user-feedback-header">
    <entry lang="en">Are we answering your questions?</entry>
    <entry lang="de">Beantworten wir Ihre Fragen?</entry>
    <entry lang="es">?stamos contestando a sus preguntas?</entry>
    <entry lang="fr">Repondons-nous a vos questions?</entry>
    <entry lang="it">Trovi le nostre risposte soddisfacenti?</entry>
    <entry lang="ja"><see original file for correct characters></entry>
</term>
```

- Edit the appropriate entry for the language of your application. For example, the default entry for English applications is:

```
<entry lang="en">Are we answering your questions?</entry>
```

Customizing the User Feedback Rating Labels

You can customize the text associated with the user feedback rating levels by by editing the value specified in the User Interface resource file, `<InQuira_home>/inquira/int/xsl/search/resource.xml`.

To modify the user feedback labels:

- Locate the user feedback section, which is indicated by the label:

```
User feedback modules / screens
```

- Locate the parameter `user-feedback-rating-n`

where:

n is the feedback rating level. For example:

```
</term>
   <term id="user-feedback-rating-5">
      <entry lang="en">Absolutely!</entry>
      <entry lang="de">Absolut!</entry>
      <entry lang="es">?bsolutamente!</entry>
      <entry lang="fr">Absolument!</entry>
      <entry lang="it">Si, assolutamente</entry>
      <entry lang="ja"><see original file for correct characters</entry>
   </term>
```

- Edit the appropriate entry for the language of your application. For example, the default English rating labels are:

Rating Level	Default Value
5	Absolutely!
4	Usually
3	Sure
2	Hardly
1	Not even close!

Customizing the User Feedback Comment Form

You customize the user feedback comment form by editing the elements that control the layout and contents of the form in the user comments form style sheet, `<InQuira_home>/inquira/int/xsl/search/user_comments_page.xsl`.

The user comments form style sheet is divided into sections that correspond to supported languages. For example, the section in English contains the following:

```
<b>Thanks for your feedback</b><br/>
        <br/>
        To date, we have added 100 new pages of content based on feedback like yours.<br/>
        <br/>
        We are currently working on providing more content in the following areas:<br/>
        <ul>
           <li> Area 1 </li>
           <li> Area 2 </li>
           <li> Area 3 </li>
           <li> Area 4 </li>
        </ul>
        <br/>
        If you would like to send us more detailed comments, please type them in below:<br/>
```

To modify the content and layout of the user feedback comment form:

- Locate the appropriate section for your language
- Edit the layout and content to suit the needs of your application

Disabling the User Feedback Feature

You can disable the user feedback feature by editing the User Interface configuration file, `<InQuira_home>/inquira/int/xsl/search/config.xsl`

To disable the user feedback feature:

- Locate the following statement in the `config.xsl` file:

```
<xsl:variable name="get-user-feedback"...select="true()" />
```

- Change the value of the `select` parameter to `false`:

```
<xsl:variable name="get-user-feedback"...select="false()" />
```

Implementing Click-Through Logging

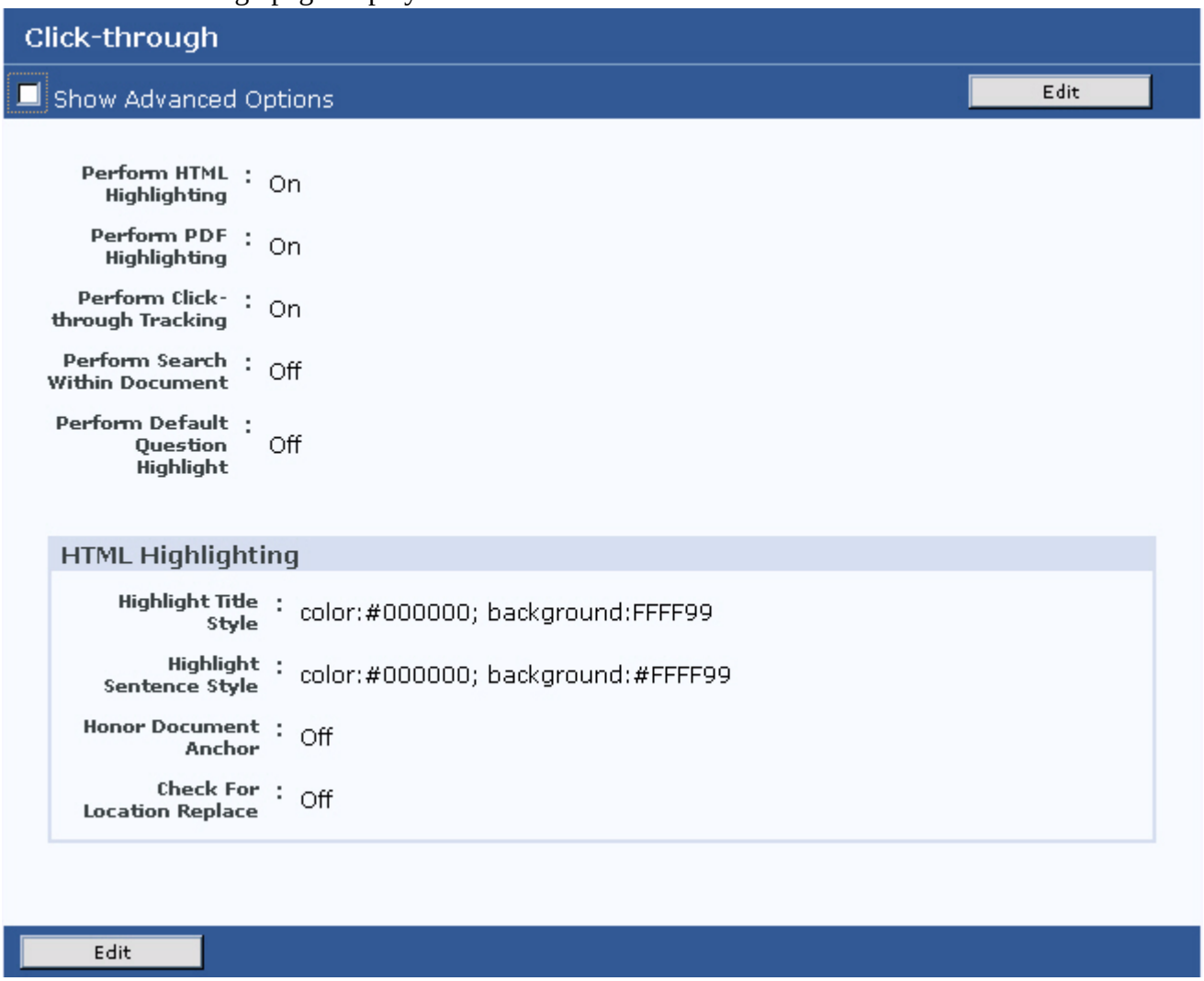
You can configure the User Interface to log information about the answer links selected by InQuira 8.1 users. Answer links are links to the page or document from which the application derived the answer.

When click-through logging is on, InQuira 8.1 logs a message with the identifier ANALYTICS_CLICK_THROUGH.

To specify click-through logging:

- Select **Click-through** from the System section of the Advanced Configuration Facility

The Click-through page displays:



- Select the **On** radio button in the **Perform Click-through Tracking** field
- Select **OK** to save your configuration

Highlighting Answers Within Documents

The User Interface displays links within answers that users can select to display the actual answer documents. You can configure the application to highlight the answer text within HTML and PDF documents.

You can implement document highlighting by:

- Enabling the highlighting feature
- Optionally specifying style attributes for highlighted titles and sentences within HTML documents
- Optionally specifying text string matching processes for HTML documents

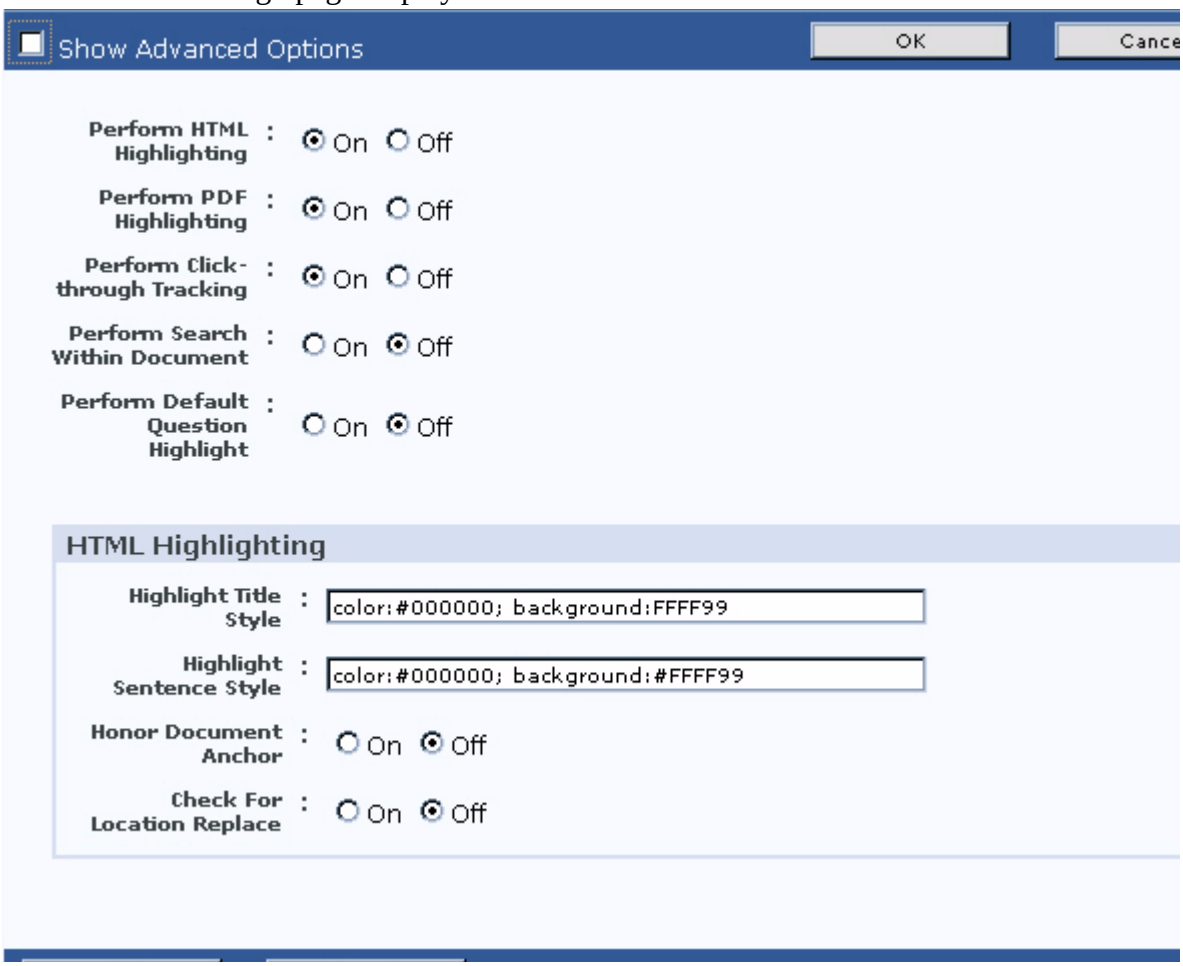
IMPORTANT: The text matching algorithm and highlighting display for PDF documents is determined by the Adobe API, and is not configurable in InQuira 8.1.

Enabling Highlighting within Answer Documents

To enable highlighting for HTML and PDF documents:

- Select **Click-through** from the System section of the Advanced Configuration Facility:

The Click-through page displays:



- Select the **On** radio button in the **Perform HTML Highlighting** field
- Select the **On** radio button in the **Perform PDF Highlighting** field
- Select **OK** to save your configuration

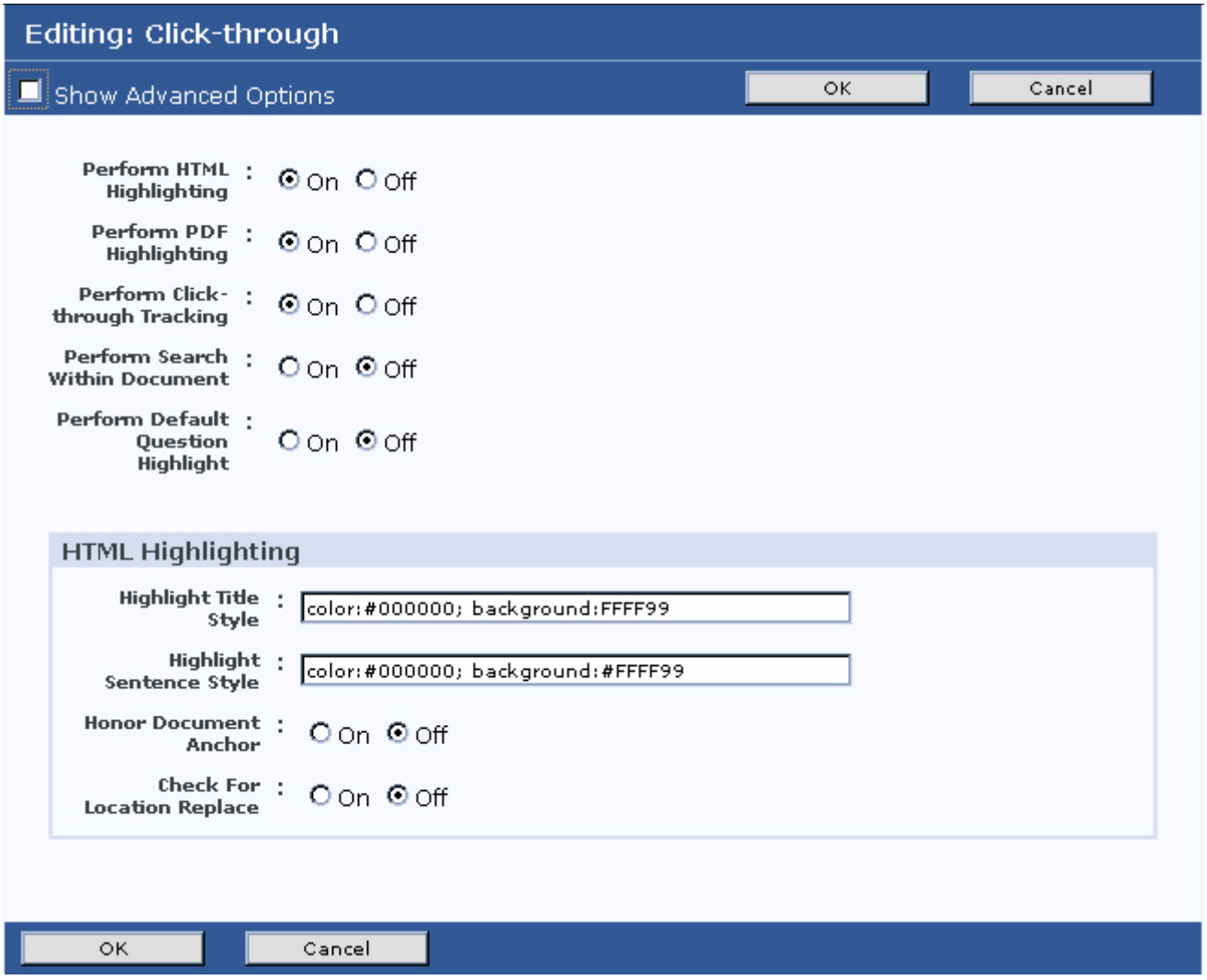
Specifying HTML Highlighting Style Attributes

You can specify HTML highlighting style attributes to apply to relevant titles and text within answer documents. You can specify any HTML statements that are valid within tags.

To specify highlighting attributes:

- Select **Click-through** from the System section of the Advanced Configuration Facility

The Click-through page displays:



- Enter valid style attributes in the desired fields:

Field	Description
Highlight Title Style	Specifies the style for titles within the document that match the answer text. The default style is `color:#000000; background:#E8F5FF`, which displays in standard browsers as black text on a light blue background.
Highlight Sentence Style	Specifies the style for text within the document that matches the answer text. The default style is `color:#000000; background:#00FF00`, which displays in standard browsers as black text on a bright green background.
Honor Document Anchor	Specifies that the application use existing anchors within documents to determine highlighted regions when opening the answer document in response to click-through.
Check for Location Replace	Specify this setting to check for this parameter, and display the re-directed location without performing highlighting if it is present in the answer URL. Location replace is a JavaScript mechanism used to redirect users from one page to another; however, the HTML highlighting feature cannot process the JavaScript properly.

Managing Multiple Languages in the User Interface

The User Interface is installed and configured with multi-lingual text that is stored in a resource file (`int/common/resource.xml`). The User Interface uses the language parameter to determine the appropriate text to display.

Since the default language parameter setting for the InQuira 8.1 application is English, the User Interface displays English text by default; however, setting the language parameter to another language automatically overrides the User Interface language setting.

For example, if the web server configuration or a selection mechanism on the question input page sets the language parameter to `FR` (French), then the User Interface displays the User Interface text element in French.

The following larger User Interface content components are also automatically translated based on the value of the language parameter

Page	Location
Tips	`int/xsl/tips.xsl`
User Comments	`int/xsl/core/user_feedback.xsl` (locate “`template name="user-comments-page"`”)
Contact deflection Thank You	`int/xsl/contact/thank_you.xsl`

There is no additional configuration required to implement the multi-lingual User Interface features; however, you can tailor the User Interface elements and other content to the needs of your organization by editing the referenced User Interface files.

Chapter 6 Creating a Custom Content Crawler

InQuira 8.1 includes a content acquisition framework containing base classes that support the creation of custom crawlers. The framework includes three classes: `CustomCrawlerConfig`, `CustomCrawlerConfigController`, and `CustomCrawlerState` that set up and instantiate a custom crawler.

Using the framework you can create custom content crawlers to access data from non-standard data sources and integrate it with InQuira 8.1. The example on *Example: Creating a Database Web Crawler* on page 77, shows you how to crawl a database that tracks content on a website not otherwise crawled and consequently not available in the Content Store.

The example includes two classes: `DBWebCrawler` and `DBWebCrawlerConfig`. The `DBWebCrawler` class extends `Crawler`, the standard InQuira 8.1 class used or extended by all crawlers that do content acquisition within the content service framework. The second class, `DBWebCrawlerConfig`, shown in *Example: Configuring the Database Web Crawler* on page 81, sets up objects used by DBWebCrawler and extends `CustomCrawlerConfig`.

After developing your custom crawler, continue by configuring it within the InQuira 8.1 environment as explained in the section, *Configuring a Custom Crawler* on page 83.

Example: Creating a Database Web Crawler

The example below can be found in the file `DBWebCrawler.java`

```
package samples.content.dbwebcrawler;

import java.io.*;
import java.util.*;
import java.sql.*;
import java.net.*;

import com.inquira.infra.*;
```

```
import com.inquira.content.*;
import com.inquira.content.custom.*;
import com.inquira.scheduler.job.*;
import com.inquira.util.sql.*;

/* The DBWebCrawler class implements a custom crawler that accesses
 * a database containing URLs of documents to crawl
 */
public class DBWebCrawler
    extends Crawler
{
    protected Connection conn;
    protected Statement st;
    protected ResultSet rs;

       /* Called by the content acquisition framework prior to
        * call starting the crawl
        */
        public void connect( CrawlerConfig configuration )
        throws CrawlerException
    {
        DBWebCrawlerConfig rcc = (DBWebCrawlerConfig)configuration;

        try {
            conn = Datasource.forName( rcc.getDatasourceName( ) ).getConnection(
);CrawlerException
            st = conn.createStatement( );
            rs = st.executeQuery( rcc.getQuery( ) );

        } catch( Throwable t ) {
            throw new CrawlerException( t );
        }
    }

    /* Called by the content acquisition framework after
     * the crawl is completed
     */
    public void rundown( )
        throws CrawlerException
    {
        try {
            if( rs != null ) {
                rs.close( );
            }
            if( st != null ) {
                st.close( );
            }
            if( conn != null ) {
                conn.close( );
            }
        } catch( Throwable t ) {
```

```
            throw new CrawlerException( t );
        }
    }

    /* Called by the content acquisition framework prior to call starting
     * the crawl after calling connect
     */
    public void start( )
    {
    }

    /* Indicates that a single call to the findContent method discovers
     * a current document
     */
    public boolean findComplete( )
    {
        return true;
    }

    /* Indicates that this is a custom crawler     */
    public ContentSourceType getType( )
    {
        return ContentSourceType.HTTP;
    }

    /* Returns all currently known document objects that are found
     * in the data source
     */
    public Collection findContent( Collection priorContent,
            CrawlerConfig conf,
            CrawlerState state,
            TaskStatus status )
        throws CrawlerException
    {

        Collection rc = new ArrayList( );

        try {
            String temp = null;

            while( rs.next( ) ) {
                String url = rs.getString( 1 );

                if( !rs.wasNull( ) && !url.equals( temp ) ) {
                    System.out.println( "Getting URL: " + url );
                    Timestamp time = rs.getTimestamp(2);

                    Document d = new Document( );

                    d.setCollection( conf.getCollection( ) );
                    d.setFetchURL( url );
```

```
                d.setDisplayURL( url );

                d.setCSType( ContentSourceType.CUSTOM );
                d.setLastModificationTime( time );
                d.setIndexingAllowed( true );
                d.setStatusCode( Document.STATUS_OK );

                rc.add( d );

                temp = url;
            } else {
                System.out.println( "NULL or Dupe!" );
            }
        }
    } catch( Throwable t ) {
        throw new CrawlerException( t );
    }

    return rc;
}

/* Returns the raw content for the given document      */
public byte[] getContent( CrawlerConfig conf, Document doc )
    throws
            CrawlerException
{
    byte[] rc = null;

    URL                 url     = null;
    URLConnection       urlconn = null;
    InputStream         is      = null;
    ByteArrayOutputStream baos    = null;

    try {
        url= new URL( doc.getFetchURL( ) );
        System.out.println( "In getContent, getting URL: " + url );
        urlconn = url.openConnection( );
        is = new BufferedInputStream( urlconn.getInputStream( ) );
        baos = new ByteArrayOutputStream( );

        byte[] buf = new byte[8192];
        int count = 0;
        while( ( count = is.read( buf, 0, buf.length ) ) > 0 ) {
            baos.write( buf, 0, count );
        }
        rc = baos.toByteArray( );

        doc.setContent( DataComponent.RAW, rc );
        doc.setDocSize( rc.length );

    } catch( ContentStoreException t ) {
```

```
            throw new CrawlerException( t );
        } catch( IOException t ) {
            throw new CrawlerException( t );
        } finally {
            if( is != null ) {
                try {
                    is.close( );
                } catch( IOException ex ) {
                    // ignore on close
                }
            }
        }

        return rc;
    }
}
```

Example: Configuring the Database Web Crawler

This supporting class, containing configuration objects for the `DBWebCrawler` example, can be found in the file `DBWebCrawlerConfig.java`

```
package samples.content.dbwebcrawler;

import java.util.*;

import com.inquira.content.*;
import com.inquira.content.custom.*;

/* The CustomCrawlerConfig class implements a custom crawler configuration
 * object that knows about two non-standard configuration items:
 *
 * datasourceName - defines the name of the data source that
 * contains the document information
 * query - defines the query string used to find the document information
 */
public class DBWebCrawlerConfig
    extends CustomCrawlerConfig
{
    private static final String __ident = "$Revision: 1.1.2.2 $";

    /* Compares the last modification dates of the two documents passed,
     * to determine if the document has changed
     */
    public boolean isModifiedDocument( Document currentDocument, Document newDocument )
    {
        return newDocument.getLastModificationTime( ).after(
currentDocument.getLastModificationTime( ) );
```

```
    }

    /* Returns the data source name     */
    public String getDatasourceName( )
        throws CrawlerException
    {
        String dataSourceName = configValues.getProperty( "datasourceName" );
        if( dataSourceName == null || dataSourceName.length( ) == 0 ) {
            throw new CrawlerException( "CUSTOM_DBWEB_CRAWLER_NO_DATASOURCE",
new Object[]{ getCollectionName( ) } );
        }

        return dataSourceName;
    }

    /* Returns the query string     */
    public String getQuery( )
        throws CrawlerException
    {
        String query = configValues.getProperty( "query" );
        if( query == null || query.length( ) == 0 ) {
            throw new CrawlerException( "CUSTOM_DBWEB_CRAWLER_NO_QUERY", new
Object[]{ getCollectionName( ) } );
        }

        return query;
    }

    /* Returns a new DBWebCrawler object     */
    public Crawler getCrawler( )
        throws CrawlerException
    {
        return new DBWebCrawler( );
    }

    /* Indicates that this crawler compares existing documents in the
     * content store with documents it discovers to identify content changes
     */
    public boolean fetchExistingContent( )
    {
        return true;
    }
}
```

Configuring a Custom Crawler

The custom crawler in this example assumes that the customer has developed an in-house content publishing system that uses a database table called "content" containing a record for every document that has been published to their website. This table contains two columns:

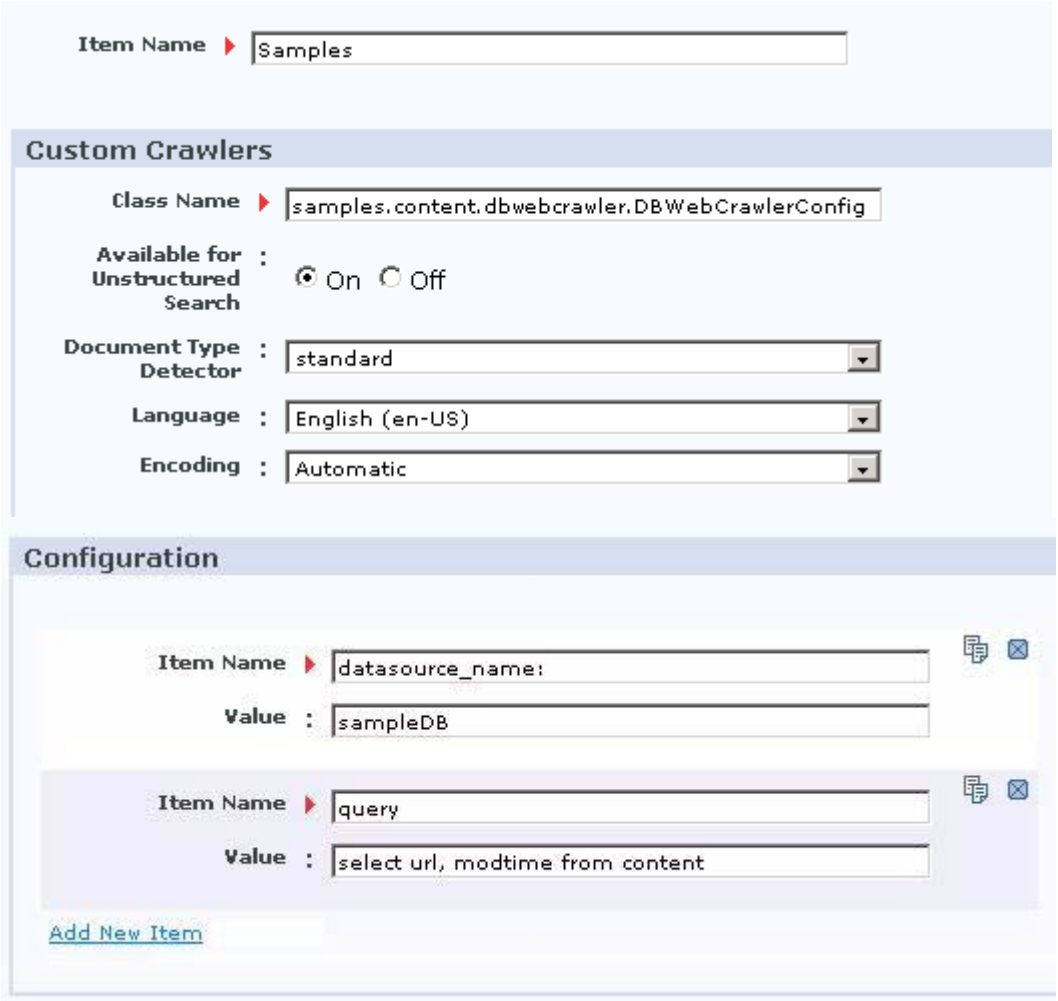
Column Name	Description
url	This column contains the URL at which the document can be accessed on the website
modtime	This column contains the last date and time the document was published

Configuration for custom crawlers is done through the **Advanced Config** settings in the System Manager. In the example below, you can see that the `url` and `modtime` fields appear as part of the query defined in the Configuration settings in the System Manager.

To configure the custom crawler:

- Open the System Manager and choose **Advanced Config** from the Tools menu.
- Select Crawler Settings and choose **Edit**.
- Under Custom Crawlers, select **Add New Item**.
- Enter the Item Name, Class Name, and add the Configuration fields for the data source and query following the example below.

Example Crawler Settings



Chapter 7 Creating a Custom Document Preprocessor

This section shows how you can customize the way in which raw document content is processed for both text and binary files. In the example, we extend the ProcessingFilterAdapter class which implements the `PreprocessingFilter` interface.

The `PreprocessingFilter` interface defines the `preprocessDocument` method (text files) and `postprocessDocument` methods (text and binary files) called by Preprocessor when it processes content. By extending the ProcessingFilterAdapter class, which implements the `PreprocessingFilter` interface, we can introduce our own preprocessing and post-processing routines as part of InQuira's standard processing of text and binary files.

In the example, described in *Example: Creating a Document Preprocessor* on page 85, we include two common preprocessing and post-processing customizations: removing footers from HTML files, and removing the table of contents from PDF files.

After developing your custom document preprocessor, continue by configuring it within the InQuira 8.1 environment as explained in the section, *Configuring a Custom Document Preprocessor* on page 89.

Example: Creating a Document Preprocessor

The example below can be found in the file `SamplePreprocessingFilter.java`

First, we import the referenced packages.

```
package samples.prep;

import java.io.*;
import java.util.*;
import java.util.regex.*;

import com.inquira.content.*;
import com.inquira.prep.*;
import com.inquira.util.xml.*;
```

Next, we set up a new custom preprocessor class by extending PreprocessingFilterAdapter, a class that implements the PreprocessingFilter interface. The PreprocessingFilterAdapter class adds the getStringContent method, which we use to get the document content for HTML files.

```
/* Implements a pre- and post-processing filter used during document conversion */
public class SamplePreprocessingFilter
    extends PreprocessingFilterAdapter
{
    /* Defines the regular expression that marks a table of contents page */
    protected Pattern tocPattern;

    /* Defines the maximum number of pages to check for table of contents */
    protected int endPage;

    /* Defines the regular expression that marks an HTML footer     */
    protected Pattern footerPattern;

    /* Creates a new PreprocessingFilter instance, while configuration
     * parameters are passed in to configProperties
     */
    public SamplePreprocessingFilter( Map configProperties )
    {
        /* Assuming the configuration looks like this:
         * <preprocessingFilter name="sample">
         *     <class>samples.prep.SamplePreprocessingFilter</class>
         *     <config>
         *         <values name="hello">def</values>
         *         <values name="xyz">zyx</values>
         *     </config>
         * </preprocessingFilter>
         *
         * The Map contains entries for keys "hello" and "xyz",
         * with values "def" and "zyx" respectively.
         */
        tocPattern = Pattern.compile( "(?i)Table of Contents", Pattern.MULTILINE );
        endPage = 10;
        footerPattern = Pattern.compile( "(?i)((\u00A9|&#169;|&copy;)[ ]*)?Copyright [0-9]+ Acme,
Inc.", Pattern.MULTILINE );
    }
```

We first check to see if it's an HTML file, and if it is, we grab the raw file contents. We then search the contents for `footerPattern` to see if it contains footers, and if it does, we strip them out and save the contents using `setContent`.

```
    /* Removes footer from HTML documents based on a regular expression  */
    public void preprocessDocument( Document document, CollectionConfig collection )
        throws PreprocessingException
    {
        System.out.println( "preprocessDocument called for " + document.getFetchURL( ) );
```

```
        if( document.getDocType( ).equals( DocumentType.HTML ) == true ) {
            try {
                StringBuffer rawContent = getStringContent( document );

                Matcher m = footerPattern.matcher( rawContent );
                if( m.find( ) == true ) {
                    String newContent = m.replaceAll( "" );
                    document.setContent( DataComponent.RAW, newContent );
                }
            } catch( ContentStoreException ex ) {
                throw new PreprocessingException( "CUSTOM_PREP_PRE_FILTER_FAILER",
                            new Object[]{ document.getFetchURL( ), new Integer( document.getDocId(
) ) }, ex );
            }
        }
    }
```

For the TOC, we first check to see if it's a PDF file, and if it is, we grab the contents. We then search the contents for `tocPattern` to see if it contains a TOC while the page number is less than `endPage`. If we find a TOC, we strip it out and return the updated string representation of the `iqxmlNode`.

```
    /* Remove Table of Contents pages from PDF documents     */
    public String postprocessDocument( Document document, CollectionConfig collection, Node
iqxmlNode )
        throws PreprocessingException
    {
        String rc = null;

        System.out.println( "postprocessDocument called for " + document.getFetchURL( ) );

        if( document.getDocType( ).equals( DocumentType.PDF ) == true ) {
            // Since we are modifying the XML Node that represents the
            // IQXML, we need to be careful not to modify the original Node
            // unless we intentionally want to modify the XML. To signal
            // that a modification was made we need to return the string
            // representation of the new XML node that represents the IQXML
            // after post processing.
            if( removeTOC( iqxmlNode, endPage ) == true ) {
                rc = iqxmlNode.toString( );
            }
        }

        return rc;
    }

    protected boolean removeTOC( Node n, int lastPage )
    {
        return removeTOC( n, new HashSet( ), lastPage );
    }
```

```
protected boolean removeTOC( Node n, HashSet skipPages, int lastPage )
{
   boolean rc = false;
   boolean afterTOC = false;

   List children = n.getChildren( );
   if( children != null ) {
      ListIterator it = children.listIterator( );
      while( it.hasNext( ) ) {
         Object o = it.next( );
         if( o instanceof Node ) {
            Node cn = (Node)o;

            String text = cn.getText( );
            if( text != null && text.length( ) > 0 ) {
               int pageNumber = getPageNumber( cn );
               if( pageNumber >= 0 ) {
                  if( pageNumber >= lastPage ) {
                     afterTOC = true;
                     break;
                  }
                  Integer nPageNumber = new Integer( pageNumber );
                  if( skipPages.contains( nPageNumber ) == true ) {
                     rc = true;
                     it.remove( );
                  } else {
                     if( tocPattern.matcher( text ).find( ) == true ) {
                        rc = true;
                        it.remove( );
                        skipPages.add( nPageNumber );
                     }
                  }
               }
            } else if( afterTOC == false ) {
               rc |= removeTOC( cn, skipPages, lastPage );
            }
         }
      }
   }

   return rc;
}
```

We use the `getPageNumber` method in the `postprocessDocument` method to check where we are in the document.

```
protected int getPageNumber( Node n )
{
   int rc = -1;
   String auxAttr = n.getAttribute( "aux" );
   if( auxAttr != null ) {
```

```
            int start = auxAttr.indexOf( " pg=" );
            if( start >= 0 ) {
               start += 4;
               int end = auxAttr.indexOf( " ", start );
               if( end > 0 ) {
                  rc = Integer.parseInt( auxAttr.substring( start, end ) );
               }
            }
         }

         return rc;
      }
   }
```

Configuring a Custom Document Preprocessor

You can define configuration information for your custom document preprocessor by adding the name of the class and configuration information to the ICE `custom.xml` file as shown below. Note that you don't need to do his unless you need to pass parameters to your custom preprocessor class.

- Locate the `custom.xml` configuration file in the `instance` folder:

  <IS installation folder>\instances\<instance name>\custom.xml

- Add a preprocessor node to the file as shown below substituting the class name for `samples.prep.SamplePreprocessingFilter`, and adding key value pairs as appropriate in the `<config>` section.

```
<preprocessor>
    <preprocessingFilter>
       <class>samples.prep.SamplePreprocessingFilter</class>
       <config>
          <values name="hello">def</values>
          <values name="xyz">zyx</values>
       </config>
    </preprocessingFilter>
</preprocessing>
```

Supporting Multiple Naviagtion Applications

To support multiple naviagtion applications, an entry similar to the following needs to be added to the custom.xml file:

```
<task-definition index="16">
<name>Classification</name>
<shortName>Navigation</shortName>
<description>Classifies the navigation facets </description>
<taskClass>com.inquira.navigate.ClassifyTask</taskClass>
<parameters index="0">-p</parameters> <!-- enable progress tracking -->
<parameters index="1">-f</parameters> <!-- applitcaion 1 name follows -->
<parameters index="2">Default</parameters> <!-- applitcaion 1 name -->
<parameters index="3">-f</parameters> <!-- applitcaion 2 name follows -->
<parameters index="4">Maven</parameters> <!-- applitcaion 2 name -->
<parameters index="5">-f</parameters> <!-- applitcaion 3 name follows -->
<parameters index="6">Quantum</parameters> <!-- applitcaion 3 name -->
<distribute>false</distribute>
<needsCollection>false</needsCollection>
<subcollection>false</subcollection>
</task-definition>
```

This overrides the default entry for the Classification task, adding the additional applications ‘Maven’ and ‘Quantum.’

Chapter 8 Creating a Custom Task

This section shows you how to implement custom tasks to work within InQuira's system framework. The examples included here show you how to set up a simple custom task, how to handle parameters, how to display document count and progress information on the System Manager status screen, and how to set up a task so that users can interrupt it, if necessary, from the job status screen.

The following examples are provided:

- *Example: Creating a Simple Custom Task* on page 92
  This example provides the basic template for crating a custom task.
- *Example: Handling Argument Parsing* on page 94
  This example provides a basic template, but adds the ability to handle arguments as parameters.
- *Example: Handling Document Count and Progress Updates* on page 98
  This example shows you how to update the document count and progress bar as documents are processed by the task.
- *Example: Handling User Task Interruptions* on page 101
  This example shows you how to test for a request from the user to interrupt processing. Note that although we provide an example, we do not encourage you to use it unless you really need to and are able to support the consequences of interrupting a task.

After creating your custom task, continue by configuring it within the InQuira 8.1 environment as explained in the section, *Configuring a Custom Task* on page 103.

Example: Creating a Simple Custom Task

The example below can be found in the file `CustomTaskTemplate.java`.

First, we import the referenced packages.

```
package com.inquira.scheduler.job;

import org.apache.commons.cli.BasicParser;
import org.apache.commons.cli.CommandLine;
import org.apache.commons.cli.CommandLineParser;
import org.apache.commons.cli.Option;
import org.apache.commons.cli.Options;
import org.apache.commons.cli.PatternOptionBuilder;

import org.apache.commons.cli.*;
import com.inquira.scheduler.*;
import com.inquira.scheduler.*;
import com.inquira.infra.*;
import com.inquira.log.*;
```

Next, we set up the new custom task class by extending `ITaskRunner` and `ILogConstants`.

```
public class CustomTaskTemplate
   implements ITaskRunner, ILogConstants {


   public void run(TaskStatus status, String[] args) throws Exception {
      boolean success = true;

      try {
```

Add the code for whatever task it is that you need to set up here

```
         /*
          *  Do the actual custom task work here
          */


      }
      catch( Exception ex ) {
         //Do any appropriate logging and exception handling
         success = false;
      }
```

Be sure to set status here to `setSuccess` if the task completes successfully, or the task defaults to `setFailed`.

```
      finally {
         //Set the status at the end of the task.
         //If the status is not set, it defaults to setFailed()
```

```
            //causing the task and any dependent tasks to fail
            if( success ) {
               status.setSuccess();
            }
            else {
               status.setFailed();
            }
         }
      }

      public Options getTaskOptions()
      {
         Options options;

         options = new Options();

         return options;

      }
   }
```

Example: Handling Argument Parsing

The example below can be found in the file `CustomTaskTemplate_Args.java`.

In the first part of this custom task example, we import the referenced packages.

```
/*
 * In this custom task example, we modify it to take arguments as
 * parameters. We use the getTaskOptions() method inherited from the
 *  ITaskRunner interface to handle argument parsing.
 */

package com.inquira.scheduler.job;

import org.apache.commons.cli.BasicParser;
import org.apache.commons.cli.CommandLine;
import org.apache.commons.cli.CommandLineParser;
import org.apache.commons.cli.Option;
import org.apache.commons.cli.Options;
import org.apache.commons.cli.PatternOptionBuilder;

import org.apache.commons.cli.*;
import com.inquira.scheduler.*;
import com.inquira.scheduler.*;
import com.inquira.infra.*;
import com.inquira.log.*;
```

Next, we set up the new custom task class by extending `ITaskRunner` and `ILogConstants`.

```
public class CustomTaskTemplate
    implements ITaskRunner, ILogConstants {

    /* Example local variables set by argument parsing     */
    boolean fOption = false;
    boolean pOption = false;
    boolean rOption = false;
    String  collectionName = null;
```

Here we process the `args` array and define task processing accordingly. Substitute your own switch values and parameters and processing options for ones appropriate to your task. Refer to *Configuring a Custom Task* on page 103 for a discussion of how to handle arguments as parameters.

```
    /*
     * Use a method like the one below to process the arguments
     * and set the local variables
     */
     private boolean processArgs( String[] args ) {
        CommandLineParser parser;
        CommandLine commandLine;
```

```
    Options optionDefinitions;
    Option[] options;
    boolean success = true;

    parser = new BasicParser();
    try {
       optionDefinitions = getTaskOptions();
       commandLine = parser.parse( optionDefinitions, args );
       options = commandLine.getOptions();

       for( int i = 0; i < options.length; i++ ) {
          List values;
          String mode;

          mode = options[i].getOpt();

          if( mode.equals( "f" ) || mode.equals( "fexample" ) ) {
             values = options[i].getValuesList();
             fOption = Boolean.valueOf( ( String )values.get( 0 ) ).booleanValue();
          }
          else if( mode.equals( "p" ) || mode.equals( "pexample" ) ) {
             values = options[i].getValuesList();
             pOption = Boolean.valueOf( ( String )values.get( 0 ) ).booleanValue();
          }
          else if( mode.equals( "r" ) || mode.equals( "rexample" ) ) {
             rOption = true;
          }
          else if( mode.equals( "c" ) || mode.equals( "collection" ) ) {
             values = options[i].getValuesList();
             collectionName = (String)values.get(0);
          }
       }
    }
    catch( Exception ex ) {
       //Do any appropriate logging
       Execution.context().log().event( ERROR_MSG, "CUSTOM_TASK_ERROR", ex );

       success = false;
    }

    return success;
}


public void run(TaskStatus status, String[] args) throws Exception {
    boolean success = true;

    try {

                if( processArguments( args ) == false ) {
                    success = false;
```

```
                return;
            }


        /*
         *  Do the actual custom task work here
         */


    }
    catch( Exception ex ) {
        //Do any appropriate logging and exception handling
        success = false;
    }
```

Be sure to set status here to `setSuccess` if the task completes successfully, or the task defaults to `setFailed`.

```
    finally {
        //Set the status at the end of the task.
        //If the status is not set, it defaults to setFailed()
        //causing the task and any dependent tasks to fail
        if( success ) {
            status.setSuccess();
        }
        else {
            status.setFailed();
        }
    }
}
```

In this section we look at how to define the parameters used when the task is run.

```
/* The getTaskOptions example below shows how to define argument
 * parsing for "-p true -f false -r -c <collectionname>"
 *
 * This example uses the Apache CLI interface. Their documentation
 * can be found on their website by searching for org.apache.commons.cli
 * for their Javadoc.
 */
    public Options getTaskOptions()
    {
        Options options;
        Option collectionOption;
        Option pOption;
        Option fOption;
        Option rOption;

        options = new Options();

        pOption = new Option( "p", "pexample", true, "Example for an option called 'p'" );
        pOption.setArgName( "true | false " );
```

```
        pOption.setOptionalArg( false );
        pOption.setRequired( false );
        pOption.setArgs( 1 );

        fOption = new Option( "f", "fexample", true, "Example for an option called 'f'" );
        fOption.setArgName( "true | false" );
        fOption.setOptionalArg( false );
        fOption.setRequired( false );
        fOption.setArgs( 1 );

        rOption = new Option( "r", "rexample", true, "Example for an option called 'r'" );
        rOption.setOptionalArg( true );
        rOption.setRequired( false );
        rOption.setArgs( 0 );

        collectionOption = new Option( "c", "collection", true, "Option for the collection name." );
        collectionOption.setArgName( "collection name" );
        collectionOption.setOptionalArg( false );
        collectionOption.setRequired( true );
        collectionOption.setArgs( 1 );

        options.addOption( pOption );
        options.addOption( fOption );
        options.addOption( rOption );
        options.addOption( collectionOption );

        return options;

    }
}
```

Example: Handling Document Count and Progress Updates

The example below can be found in the file `CustomTaskTemplate_Prog.java`.

In the first part of this example, we import the referenced packages.

```
/*
 * This custom task template provides examples for
 * updating progress bar and document count information.
 */


package com.inquira.scheduler.job;

import org.apache.commons.cli.BasicParser;
import org.apache.commons.cli.CommandLine;
import org.apache.commons.cli.CommandLineParser;
import org.apache.commons.cli.Option;
import org.apache.commons.cli.Options;
import org.apache.commons.cli.PatternOptionBuilder;

import org.apache.commons.cli.*;
import com.inquira.scheduler.*;
import com.inquira.scheduler.*;
import com.inquira.infra.*;
import com.inquira.log.*;
```

Next, we set up the new custom task class by extending `ITaskRunner` and `ILogConstants`.

```
public class CustomTaskTemplate
    implements ITaskRunner, ILogConstants {


    public void run(TaskStatus status, String[] args) throws Exception {
        boolean success = true;

        try {
```

Add the code for your task here calling the appropriate method to update the document count and progress bar as indicated in the comments below. Note that the method should only be called by tasks that use a looping structure to process data so that a counter or progress indicator can be updated for each iteration of the loop.

```
            /*
             * Do the actual custom task work here.
             */

            /*
```

```
    * The examples below show how to handle progress bar updates
    * and document count updates for the task status screens in
    * System Manager. They should be called from within tasks
    * that use a looping structure, updating the doc count or
    * progress bar as a loop iteration is completed.
    *
    * Option 1 for updating progress
    * status.setProgress( value );
    * This can be called periodically if
    * a value of 1 - 100 is known and it
    * makes sense to update progress with
    * a specific value
    *
    * Option 2 for updating progress
    * status.incrementProgress( incrementalvalue );
    * This can be called periodically
    * to increment the progress
    * by some incremental value. If the
    * progress was 35 and the value passed
    * to this method is 4, the new progress
    * will be 39.
    *
    * Option 3 for updating progress and doc count
    * (used only if the task iterates over
    * a set of documents once). This option can also only
    * be used if the total number of documents to be processed
    * is known at the beginning of the task.
    *
    * status.setTotalDocCount( total );
    * This should be called at the beginning
    * of the task, not inside the loop
    *
    * status.incrementDocProgress();
    * This should be called from inside the loop, once
    * for each document that was processed. Internally
    * it will increment the counter for how many documents
    * were processed, and also calculate the progress
    * percentage based on the processed documents divided
    * by the totalDocCount() value.
    *
    * Option 4 for updating doc count but not progress
    * status.incrementDocCount();
    * Increments the current doc count processed by 1,
    * it starts at 0 at the beginning of every task.
    */

}
catch( Exception ex ) {
   //Do any appropriate logging and exception handling
   success = false;
}
```

Be sure to set status here to `setSuccess` if the task completes successfully, or the task defaults to `setFailed`.

```
        finally {
            //Set the status at the end of the task.
            //If the status is not set, it defaults to setFailed()
            //causing the task and any dependent tasks to fail
            if( success ) {
                status.setSuccess();
            }
            else {
                status.setFailed();
            }
        }
    }

    public Options getTaskOptions()
    {
        Options options;

        options = new Options();

        return options;

    }
}
```

Example: Handling User Task Interruptions

The example below can be found in the file `CustomTaskTemplate_Prog.java`.

In the first part of this example, we import the referenced packages.

```
/*
 * In this custom task example we add a method you can call from
 * within a task loop to periodically check if a user has used the
 * job-status screen to request that the current task stop
 * processing and exit.
 *
 * It is up to the custom task code to do any necessary data
 * cleanup. If it cannot do this properly, it should not attempt to
 * support task interruption.
 */

package com.inquira.scheduler.job;

import org.apache.commons.cli.BasicParser;
import org.apache.commons.cli.CommandLine;
import org.apache.commons.cli.CommandLineParser;
import org.apache.commons.cli.Option;
import org.apache.commons.cli.Options;
import org.apache.commons.cli.PatternOptionBuilder;

import org.apache.commons.cli.*;
import com.inquira.scheduler.*;
import com.inquira.scheduler.*;
import com.inquira.infra.*;
import com.inquira.log.*;
```

Next, we set up the new custom task class by extending `ITaskRunner` and `ILogConstants`.

```
public class CustomTaskTemplate
    implements ITaskRunner, ILogConstants {


    public void run(TaskStatus status, String[] args) throws Exception {
        boolean success = true;

        try {
```

Add the code for your task here calling the `isInterrupted` method from within a loop to check whether the user has requested that the task be interrupted. Note that for the `isInterrupted` method to be useful it must be called from inside a loop as documents or other data are processed, so that it can poll for a change in status at each loop iteration.

```
            /*
             *  Do the actual custom task work here
```

```
            */

            /*
             * Handling user-interrupted task requests is only viable if
             * the task is structured in some form of loop where it can
             * periodically check if there is an outstanding request for
             * the task to interrupt itself. This should only
             * be done if if the custom task code can cleanly
             * interrupt its work without corrupting any data.
             */
             status.isInterrupted();
            //Check this method periodically in a loop. If it returns
            //true, then a user has used the job-status screen to request
            //that the current job/tasks stop processing and exit.

            //An interrupted task should be treated as a failed
            //      task, so be sure to set success to false or
            //      otherwise ensure that status.setFailed() is called
           }
        catch( Exception ex ) {
            //Do any appropriate logging and exception handling
            success = false;
        }
```

Be sure to set status here to `setSuccess` if the task completes successfully, or the task defaults to `setFailed`.

```
        finally {
            //Set the status at the end of the task.
            //If the status is not set, it defaults to setFailed()
            //causing the task and any dependent tasks to fail
            if( success ) {
                status.setSuccess();
            }
            else {
                status.setFailed();
            }
        }
    }

    public Options getTaskOptions()
    {
        Options options;

        options = new Options();

        return options;

    }

}
```

Configuring a Custom Task

To configure a custom task:

- Use one of the example templates to develop your custom task class.
- Save the file and class using the appropriate local naming conventions.
- Configure the placeholders for custom tasks in the <*number*>.xml file. You'll need to do this by hand as they cannot be configured through the System Manager. The supported placeholders can be found by searching for "PlaceholderTask" in <*number*>.xml, based on your particular task. The list of supported custom task placeholders include:
  - Pre content update
  - Pre document conversion
  - Pre indexing
  - Pre propagation
  - Pre synchronization
  - Post propagation/synchronization
  - Pre log loading
  - Post analytics processing (both Search and IM)
- Select the correct placeholder task and replace the taskClass configuration node (which is set by default to "com.inquira.scheduler.job.PlaceholderTask") with the name of the newly defined class. An example is shown below:

```
<task-definition index="4">
<name>Pre-Document Conversion</name>
<description>Custom task to be run before document conversion.</description>
<taskClass>com.customer.services.custom.NewTask</taskClass>
<distribute>false</distribute>
<needsCollection>false</needsCollection>
<subcollection>false</subcollection>
</task-definition>
```

Other than taskClass, no other configuration nodes should be modified unless parameters are required.

- Compile the custom class and store it in the appropriate services.jar file so that ICE can add it to the classpath. This ensures that when the scheduler runs the task, the custom code is invoked rather than the PlaceholderTask class.
- To add parameters to the task definition, add parameter nodes as shown in the example below. For example, to add "-p true", "-f false", and "-r" as parameters you would add the following parameter nodes:

```
<parameters index="0">-p</parameters>
<parameters index="1">true</parameters>
<parameters index="2">-f</parameters>
<parameters index="3">false</parameters>
<parameters index="4">-r</parameters>
```

- If the collection name is a required parameter, set the `<needsCollection>` node to "true" and the last parameter specified to "-c". If you follow this convention the scheduler automatically adds the collection name to the arguments passed into the task. A sample result is shown below. Note that -c is the last parameter and that `needsCollection` is set to true. The `args[]` array would include the following data based on the task definition below when the task is run:

```
args[0] = "-p"
args[1] = "true"
args[2] = "-f"
args[3] = "false"
args[4] = "-r"
args[5] = "-c"
args[6] = "<collectionname>"
```

```
<task-definition index="4">
<name>Pre-Document Conversion</name>
<description>Custom task to be run before document conversion.</description>
<taskClass>com.customer.services.custom.NewTask</taskClass>
<parameters index="0">-p</parameters>
<parameters index="1">true</parameters>
<parameters index="2">-f</parameters>
<parameters index="3">false</parameters>
<parameters index="4">-r</parameters>
<parameters index="5">-c</parameters>
<distribute>false</distribute>
<needsCollection>true</needsCollection>
<subcollection>false</subcollection>
</task-definition>
```

NOTE: When you set `<needsCollection>true</needsCollection>` thereby requiring a collection, it also dictates that the task runs once for each collection defined in the job definition. Therefore, the last parameter is a new collection name each time the task is run.

Chapter 9 Creating a Custom Authentication Interface

The default InQuira 8.1 authentication interface uses Lightweight Directory Access Protocol (LDAP) to verify user access to InQuira 8.1 modules. In some cases, you may want to bypass the default authentication implementation to, for example, access user information stored in a database.

The following examples provide instructions for:

- *Example: Creating a Simple Custom Authenticator* on page 106

  Creating a basic custom authenticator built on the IAuthenticator interface.

- *Example: Simple Unit Testing of a Custom Authenticator* on page 108

  Unit-testing a custom authenticator.

- *Example: Configuration-based Test for IAuthenticator Objects* on page 110

  Testing the configured security service (IAAS).

For the code to compile, you need to download both the file for the specific authenticator and the file `TestBase.java`, which contains some of the classes called by the authenticators.

After creating your custom authenticator, continue by configuring it within the InQuira 8.1 environment as explained in the section, *Configuring a Custom Authenticator* on page 111.

Example: Creating a Simple Custom Authenticator

The example below can be found in the file `TestAuthenticator.java`, and the shared authenticator classes can be found in `TestBase.java`.

We import the referenced packages, including `TestBase.java`, which contains the shared classes referenced by the authenticator examples.

```
package samples.security.authentication;

import java.util.*;
import java.security.*;

import com.inquira.infra.*;
import com.inquira.infra.security.*;
import com.inquira.infra.security.impl.*;
import com.inquira.util.security.*;
```

We implement TestAuthenticator and get the user ID and password

```
/* This is a sample implementation of an authenticator  */
public class TestAuthenticator
    extends TestBase
    implements IAuthenticator
{
    private static final String __ident = "$Revision: 1.1.2.1 $";

    protected String domain = "Test";

    protected Field[] authenticationFields = new Field[] {InputField
                                new InputField( IFieldNames.FIELD_USER_ID ),
                                new InputField( IFieldNames.FIELD_PASSWORD, true ) };

    public IUser authenticate( FieldValue[] userInfo, Map roles2PermissionsMap, long timestamp )
        throws InquiraAuthenticationException
    {
        IUser rc = null;

        System.out.println( "TestAuthenticator.authenticate: called" );

        String userId = getFieldValue( IFieldNames.FIELD_USER_ID, userInfo );

        System.out.println( "TestAuthenticator.authenticate: userId: " + userId );

        if( userId != null ) {
            String password = getFieldValue( IFieldNames.FIELD_PASSWORD, userInfo );

            System.out.println( "TestAuthenticator.authenticate: password: " + password );
```

If the password is correct, we set up the user permissions to return using `buildUser` (defined in `TestBase.java`), and print them for test purposes. If the password is incorrect or null, we handle the exception by calling `InquiraAuthenticationException.`

```
            if( password != null && password.equals( userId ) == true ) {
               rc = buildUser( userId, domain, userInfo, roles2PermissionsMap, timestamp );
            }
         }

         if( rc == null ) {
            throw new InquiraAuthenticationException( "LOGIN_FAILED", new Object[]{ getDomain(
), userId } );
         }

         System.out.println( "TestAuthenticator.authenticate: returns: " + rc );

         return rc;
      }
```

Get and return the domain (should return "Test" for the example)

```
      public String getDomain( )
      {
         return domain;
      }

      public Field[] getAuthenticationFields( )
         throws InquiraAuthenticationException
      {
         return authenticationFields;
      }
```

We get and print the values of authenticator, get the user's ID and password, and authenticate the user based on the ID and password. We then print out the user permissions.

```
      public static void main( String[] args )
         throws Exception
      {
         IAuthenticator authenticator = new TestAuthenticator( );

         System.out.println( authenticator );

         FieldValue[] userInfo = new FieldValue[]{ new FieldValue( IFieldNames.FIELD_USER_ID,
args[0] ),
                                                   new FieldValue( IFieldNames.FIELD_PASSWORD, args[1] ) };


         IUser user = (IUser)authenticator.authenticate( userInfo, getRole2PermissionsMap( ),
System.currentTimeMillis( ) );
         user.dump( );
```

```
        System.out.println( "security keys: " + user.getSecurityKeys( ) );
        for( int i = 2; i < args.length; i++ ) {
            System.out.println( "has access to " + args[i] + ": " + user.hasAccess( new
com.inquira.infra.security.ContentPermission( args[i] ) ) );
        }
    }
}
```

Example: Simple Unit Testing of a Custom Authenticator

The example below can be found in the file `AuthenticatorTest.java`, and the shared authenticator classes can be found in `TestBase.java`

We import the referenced packages, including `TestBase.java`, which contains the shared classes referenced by the authenticator examples.

```
package samples.security.authentication;

import java.util.*;
import java.security.Permission;

import com.inquira.infra.*;
import com.inquira.infra.security.*;
import com.inquira.infra.security.impl.*;
import com.inquira.config.*;

public class AuthenticatorTest
{
    private static final String __ident = "$Revision: 1.1.2.1 $";

    public static final String ROLE_LANG_DEV        = "LanguageDevelopment";
    public static final String ROLE_LANG_ADMIN      = "LanguageAdministrator";
    public static final String ROLE_ANALYTICS_ADMIN = "AnalyticsAdministrator";
    public static final String ROLE_ADMIN           = "Administrator";

    protected static final Set USABLE_PERMISSIONS;
    public static final Map DEFAULT_ROLE_PERMISSIONS;
    static {
        HashSet tmp = new HashSet( );
        String[] allPermissions = InquiraPermissions.PERMISSIONS;
        for( int i = 0; i < allPermissions.length; i++ ) {
            Permission p = new StandardPermission( allPermissions[i] );
            if( p.equals( new StandardPermission( InquiraPermissions.USERS ) ) == false ) {
                tmp.add( p );
            }
        }
```

```
        USABLE_PERMISSIONS = Collections.unmodifiableSet( tmp );

        DEFAULT_ROLE_PERMISSIONS = new HashMap( );
        HashSet langDevPerm = new HashSet( );
        langDevPerm.add( new StandardPermission( InquiraPermissions.DICTIONARY ) );
        langDevPerm.add( new StandardPermission( InquiraPermissions.TESTING ) );
        langDevPerm.add( new StandardPermission( InquiraPermissions.QUALITY_MONITOR ) );
        DEFAULT_ROLE_PERMISSIONS.put( ROLE_LANG_DEV, langDevPerm );

        HashSet langAdminPerm = new HashSet( langDevPerm );
        langAdminPerm.add( new StandardPermission( InquiraPermissions.TOP_LAYERS ) );
        langAdminPerm.add( new StandardPermission( InquiraPermissions.DOMAIN_GROUPS ) );
        langAdminPerm.add( new StandardPermission( InquiraPermissions.DOMAINS ) );
        langAdminPerm.add( new StandardPermission( InquiraPermissions.ONT_BUILDER ) );
        langAdminPerm.add( new StandardPermission( InquiraPermissions.NAVIGATION_SETUP
) );
        DEFAULT_ROLE_PERMISSIONS.put( ROLE_LANG_ADMIN, langAdminPerm );

        HashSet analyticsAdminPerm = new HashSet( );
        analyticsAdminPerm.add( new StandardPermission(
InquiraPermissions.ANALYTICS_ADMIN ) );
        DEFAULT_ROLE_PERMISSIONS.put( ROLE_ANALYTICS_ADMIN, analyticsAdminPerm
);

        DEFAULT_ROLE_PERMISSIONS.put( ROLE_ADMIN, USABLE_PERMISSIONS );
    }

    public static void main( String[] args )
        throws Exception
    {
        ArrayList l = new ArrayList( );
        IAuthenticator auth = (IAuthenticator)Execution.context( ).config( ).get( new Key( args[0] ) );
        System.out.println( auth );
        l.add( auth );

        IAAS aas = new AASImpl( l, DEFAULT_ROLE_PERMISSIONS );
        System.out.println( aas );

        FieldValue[] userInfo = new FieldValue[]{ new FieldValue( IFieldNames.FIELD_USER_ID,
args[1] ),
                                                  new FieldValue( IFieldNames.FIELD_PASSWORD, args[2] ),
                                                  new FieldValue( IFieldNames.FIELD_DOMAIN, args[3] ) };

        RoleBasedUser user = (RoleBasedUser) aas.login( userInfo );
        user.dump( );
    }
}
```

Example: Configuration-based Test for IAuthenticator Objects

The example below can be found in the file `AASTest.java`, and the shared authenticator classes can be found in `TestBase.java`.

We import the referenced packages, including `TestBase.java`, which contains the shared classes referenced by the authenticator examples.

```
package samples.security.authentication;

import java.util.*;
import java.security.Permission;

import com.inquira.infra.*;
import com.inquira.infra.security.*;
import com.inquira.infra.security.impl.*;

/* Tests the currently configured AAS */
public class AASTest
{
   private static final String __ident = "$Revision: 1.1.2.1 $";

   public static void main( String[] args )
      throws Exception
   {
      IAAS aas = (IAAS)Execution.context( ).aas( );
      System.out.println( aas );

      FieldValue[] userInfo = new FieldValue[]{ new FieldValue( IFieldNames.FIELD_USER_ID,
args[0] ),
                                    new FieldValue( IFieldNames.FIELD_PASSWORD, args[1] ),
                                    new FieldValue( IFieldNames.FIELD_DOMAIN, args[2] ) };

      IUser user = (IUser) aas.login( userInfo );
      user.dump( );

      if( args.length > 3 ) {
         System.out.println( aas.getPermission( args[3] ) );
      }
   }
}
```

Configuring a Custom Authenticator

After creating your custom authenticator, add the name of the class to the InQuira configuration file as shown below:

- Locate the latest <*number*>.xml configuration file in the configuration folder:

  %APROOT%\development\content\data\config\default\<*number*>.xml

- Open the file and search for "<choices>".
- Add the customAuthenticator element under <choices> as shown in the example. For the <class> element, replace "customAuthenticator" with the name of your custom class and add an index element that identifies the specific version.

```
<choices>
<customAuthenticator index="0">
<class>com.inquira.infra.security.impl.TestAuthenticator</class>
</customAuthenticator>
```

- Next, define the customAuthenticator as the configured securityService by specifying the keyref as shown below. Replace "choices.customAuthenticator[0]" with the name of your custom class and index.

```
<securityService>
<authenticator index="1" keyref="choices.customAuthenticator[0]" />
</securityService>
```

- Your edited file should look similar to the one shown below:

```
<serviceConfiguration name="default">
<securityService>
<authenticator index="1" keyref="choices.customAuthenticator[0]" />
</securityService>
<choices>
<customAuthenticator index="0">
<class>com.inquira.infra.security.impl.TestAuthenticator</class>
</customAuthenticator>
```

Chapter 10 Integrating an External Authentication Application

If you're using a single-sign-on application you may want to bypass the default InQuira 8.1 authentication interface to intercept the qualified user data it passes, and use that to set up user access to InQuira 8.1.

Use the examples provided in:

- *Example: Integrating a Delegation Authenticator* on page 114

  This example shows you how to integrate an external authentication application using the `IDelegationAuthenticator` interface, which extends regular authenticating modules that integrate with single-sign-on solutions.

- *Example: Integrating a Delegation Detector* on page 116

  This example shows you how to integrate an external authentication application using the `IDelegationDetector` interface. `The IDelegationDetector` interface, in turn, is used by the request processor to extract the user information from single-sign-on solutions.

NOTE: For the code to compile, download both the file for the specific authenticator and the file `TestBase.java`, which contains some of the classes called by the examples.

After creating your custom delegation authenticator or delegation detector, continue by configuring it within the InQuira 8.1 environment as explained in the section, *Configuring a Delegation Authenticator or Detector* on page 118.

Example: Integrating a Delegation Authenticator

The example below can be found in the file DelegationAuthenticator.java

```
package samples.security.delegation;

import java.util.*;
import java.security.*;

import com.inquira.infra.*;
import com.inquira.infra.security.*;
import com.inquira.infra.security.impl.*;
import com.inquira.request.*;

import samples.security.authentication.*;

/* This class supports simple delegation authorization functionality */
public class TestDelegationAuthenticator
    extends TestBase
    implements IDelegationAuthenticator
{
    private static final String __ident = "$Revision: 1.1.2.2 $";

    protected String domain = "Delegation";
    protected Field[] authenticationFields = new Field[0];
    //Indicates that it cannot be used to display a login screen

    public IUser authenticate( FieldValue[] userInfo, Map roles2PermissionsMap, long timestamp )
        throws InquiraAuthenticationException
    {
        // Since we only want to test delegation, we provide
        // no mechanism to authenticate a user
        // through a login screen.
        return null;
    }

    public IUser delegate( FieldValue[] userInfo, Principal principal, Map roles2PermissionsMap,
long timestamp )
        throws InquiraAuthenticationException
    {
        IUser rc = null;

        System.out.println( "TestDelegationAuthenticator.delegate: called" );

        String userId = getFieldValue( IFieldNames.FIELD_USER_ID, userInfo );
        System.out.println( "TestDelegationAuthenticator.delegate: userId: " + userId );

        if( userId != null ) {
            rc = buildUser( userId, domain, userInfo, roles2PermissionsMap, timestamp );
```

```
        }

        System.out.println( "TestDelegationAuthenticator.delegate: returns: " + rc );

        return rc;
    }

    public String getDomain( )
    {
        return domain;
    }

    public Field[] getAuthenticationFields( )
        throws InquiraAuthenticationException
    {
        return authenticationFields;
    }

    public static void main( String[] args )
        throws Exception
    {
        IDelegationAuthenticator authenticator = new TestDelegationAuthenticator( );

        System.out.println( authenticator );

        FieldValue[] userInfo = new FieldValue[]{ new FieldValue( IFieldNames.FIELD_USER_ID,
args[0] ),
                                        new FieldValue( IFieldNames.FIELD_DOMAIN,
authenticator.getDomain( ) ) };


        IUser user = (IUser)authenticator.delegate( userInfo, null, getRole2PermissionsMap( ),
System.currentTimeMillis( ) );
        if( user != null ) {
            user.dump( );
        } else {
            System.out.println( "Delegation for " + args[0] + " failed" );
        }
    }
}
```

Example: Integrating a Delegation Detector

The example below can be found in the file `DelegationDetector.java`

```
package com.inquira.infra.security.impl;

import com.inquira.infra.*;
import com.inquira.infra.security.*;
import com.inquira.request.*;

/* This class implements a simple delegation detector */
public class TestDelegationDetector
    implements IDelegationDetector
{
    private static final String __ident = "$Revision: 1.4.4.1 $";

    protected String domain;

    public TestDelegationDetector( )
    {
    }
    public FieldValue[] detectDelegation( Request request )
    {
        return new FieldValue[]{
            new FieldValue( IFieldNames.FIELD_USER_ID,
System.getProperty( "user.name" ) ),
           new FieldValue( IFieldNames.FIELD_DOMAIN, "INQUIRA" )
};
    }

    public FieldValue[] detectDelegation( Request request )
    {
        FieldValue[] rc = null;
        String userId = null;

        System.out.println(
"TestDelegationAuthenticator.detectDelegation: called" );

        try {
            userId = request.getUserName( );
        } catch( Exception ex ) {
            //ignore since we don't have a valid user then
        }

        System.out.println(
"TestDelegationAuthenticator.detectDelegation: userId: " +
userId );
```

```
        if( userId != null && ( userId = userId.trim( ) ).length(
) > 0 ) {
            rc = new FieldValue[] {
                     new FieldValue( IFieldNames.FIELD_USER_ID,
userId ),
                      new FieldValue( IFieldNames.FIELD_DOMAIN,
domain ) };
        }


        System.out.println(
"TestDelegationAuthenticator.detectDelegation: returns: " + rc
);

        return rc;
    }

    public static void main( String[] args )
        throws Exception
    {
        IDelegationAuthenticator authenticator = new
TestDelegationAuthenticator( );
        TestDelegationDetector detector = new
TestDelegationDetector( );
        detector.domain = authenticator.getDomain( );

        System.out.println( detector );
        System.out.println( authenticator );

        Request request = new Request( );
        request.setUserName( args[0] );

        FieldValue[] userInfo = detector.detectDelegation(
request );

        IUser user = (IUser)authenticator.delegate( userInfo,
null, TestDelegationAuthenticator.getRole2PermissionsMap( ),
System.currentTimeMillis( ) );
        if( user != null ) {
            user.dump( );
        } else {
            System.out.println( "delegation for " + args[0] + "
failed" );
        }
    }
}
```

Configuring a Delegation Authenticator or Detector

After creating your new delegation detector, add the name of the class to the InQuira configuration file as shown below:

- Locate the latest <*number*>.xml configuration file in the configuration folder:

  %APROOT%\development\content\data\config\default\<*number*>.xml

- Open the file and search for "<choices>".
- Add the <delegationDetector> element under <choices> as shown below. Replace "TestDelegationDetector" with the name of your custom class and add a name element that identifies the specific version.

```
<choices>
<delegationDetector name="test">
<class>com.inquira.infra.security.impl.TestDelegationDetector</class>
</delegationDetector>
```

- Define the delegationDetector in as the configured securityService by specifying the keyref as shown below. Replace "delegationDetector[test]" with the name of your custom class and version name.

```
<securityService>
<delegationDetector keyref="choices.delegationDetector[test]" />
</securityService>
```

- Your edited file should look similar to the one below:

```
<serviceConfiguration name="default">
<securityService>
<delegationDetector keyref="choices.delegationDetector[test]" />
</securityService>
<choices>
<delegationDetector name="test">
<class>com.inquira.infra.security.impl.TestDelegationDetector</class>
</delegationDetector>
```

Chapter 11 Creating an Action Plugin

This section deals with how to create a plugin for use within dictionary rules. The example, *Example: Creating an Action Plugin* on page 119, implements a class that can be used to trigger an action in a rule that calls the plugin. You can have the rule be called for every question, and then implement your own custom condition.

After creating your custom plugin, continue by configuring it within the InQuira 8.1 environment as explained in the section, *Configuring an Action Plugin* on page 121.

Example: Creating an Action Plugin

The example below can be found in the file `ActionGeneratorPlugin.java`.

In the first part of this example, we import the referenced packages and display the copyright notices.

```
package com.CLIENT_NAME.inquira.action;

import com.inquira.dictionary.rules.userdata.AnswerPart
import com.inquira.dictionary.DictionaryObjectTypes;
import com.inquira.dictionary.answerlayout.AnswerPart;
import com.inquira.dictionary.answerlayout.FacetRestriction;
import com.inquira.dictionary.dictobjs.ActionRule;
import com.inquira.evaluator.Action;
import com.inquira.evaluator.ActionGenerator;
import com.inquira.evaluator.SetFacetRestrictionAction;
import com.inquira.infra.Execution;
import com.inquira.infra.InquiraException;
import com.inquira.intents.*;
import com.inquira.match.Matcher;
import com.inquira.match.SentenceMatcher;
import com.inquira.match.VariableInstantiation;
import com.inquira.match.expression.IMLExpression;
import com.inquira.nlp.Sentence;
import com.inquira.request.RequestContext;
```

```
/*
 * This class can be used to trigger an action in a rule that calls
 * this plugin.  You can have the rule be called for every question, and
 * then implement your own custom condition below.
 */
```

Next, we implement the action plugin based on the ActionGenerator interface.

```
public class MyPluginActionGenerator
    implements ActionGenerator {

  /* This method is triggered when the plugin fires based on rules   */
  public Action[] generate(RequestContext requestContext, AnswerPart answerPart,
                           Sentence sentence,
                           VariableInstantiation variableInstantiation, Map map) throws
    InquiraException {

    IntentService is = Execution.context().intents();
    Action[] actions = new Action[0];

    //Test for condition to trigger the action you want

    actions = new Action[1];
```

In this example, we set up a facet restriction as our rule-based action. By setting up and defining your own action as `actions[0]` below, you can use this example to trigger other actions.

```
     /* Example
      * FacetRestriction fr = new FacetRestriction("\"CRID." +
      * contentRecordID.toUpperCase() + "\"", true);
      * actions[0] = new PluginExactSearchAction(answerPart, fr, "FACET" +
      * facetIML);
      */

    return actions;
  }
}
```

Configuring an Action Plugin

After creating your action plugin, add the name of the class to the InQuira configuration file as shown below:

- Locate the latest <*number*>.xml configuration file in the configuration folder:

  %APROOT%\development\content\data\config\default\<*number*>.xml

- Open the file and search for "<PluggableConsequences>".
- Under <PluggableConsequences> add a new section like the one shown below:

```
<Consequence name="Followup">
  <description>Module for recreating followup questions</description>
   <class> com.inquira.analysis.followup.FollowupActionGenerator </class>
   <parameter index="0"> type </parameter>
</Consequence>
```

- Enter the plugin name, description, class name, and parameter for the new plugin.The parameter ("type" in this case), appears as text in a text box in the Workbench when you choose the plugin.
- Once the plugin has been added to the configuration file, it appears as a selection in the Plugin drop-down list when you set up a rule in the Dictionary Manager. For information on how to set up plugins as answer actions for rules, refer to *Advanced Features of Rules* in the *Intelligent Search Optimization Guide*.

Chapter 12 Creating a Custom Preference Handler

This section describes how to set up a custom preference handler by creating a new Java class that extends NamedHandler (see the example in *Example: Creating a Preference Handler* on page 123).

After creating your custom preference handler, continue by configuring it within the InQuira 8.1 environment as explained in the section, *Configuring a Preference Handler* on page 124.

Example: Creating a Preference Handler

The example below can be found in the file `PreferenceHandler.java`

In the first part of this example, we import the referenced packages.

```
package samples.preferencehandler;

import com.inquira.request.*;
import com.inquira.infra.Execution;
import com.inquira.preference.*;

import java.util.regex.*;
import java.util.*;
```

Next, we set up the custom preference handler class by implementing the `NamedHandler` interface.

```
public class SamplePreferenceHandler implements NamedHandler
{

    public RequestContext handle(RequestContext rc) throws HandlerException
    {
        // Get parameters
        Properties prop = rc.getUserAgentRequestParameters();

        try {
```

```
            PreferenceService prefs = Execution.context().preferences();
            System.out.println("*** Got Preference ***");

            //Loop through the property names
            Enumeration e = prop.propertyNames();
            while (e.hasMoreElements())  {
                String propName = (String)e.nextElement();
                System.out.println("*** Got prop: " + propName);
                System.out.println("*** " + propName + " has a value of: " +
prop.getProperty(propName));

                //Assign a property value referenced by a context variable of the property name
                PreferenceValue pv = prefs.setPreferenceValue(propName,
prop.getProperty(propName));
             }
         }
         catch(Exception ex) {
            System.err.println("!!! Error getting preferences! " + ex);
         }

         return rc;
     }

    public String getHandlerName( )
    {
       return "Sample Preference";
    }
}
```

Configuring a Preference Handler

After creating the custom preference handler, add the name of the class to the InQuira configuration file as shown below:

- Locate the latest <*number*`.xml`> configuration file in the configuration folder:

  %APROOT%\development\content\data\config\default\<*number*>.xml
- Open the file and search for `<requests name="AnswerQuestion">`.
- In the list of classes named <handlers>, add your preference handler class as `index=1` renaming all the subsequent ones.

Chapter 13 Rendering Web Pages Using a Custom Agent

This section presents an example of how to render web pages using a custom transformation tool. The example is generic, in that it does not assume anything about the type of output you may want to produce. It simply sets up the gateway, retrieves the data, and does a standard XSL transformation.

In the example (*Example: Rendering a Web Page Using a Custom Agent* on page 125), we set up a client (IClient) and initialize a connection through a SOAP gateway with the InQuira 8.1 backend. Using a subclass (XMLAgent) of the class (Agent) used by InQuira 8.1, the example gets the request parameter that defines how the retrieved data is presented in the InQuira 8.1 user interface, and continues by retrieving the data. Since XMLAgent does not carry out the transformation included in Agent, the example continues by transforming the returned XML (GIML) using the standard XSL transformation.

Prior to doing the transformation, the example sets up access to a DOM node. Using the DOM node to access the returned XML data, you can substitute your own rendering algorithms to produce output other than the standard HTML produced by InQuira 8.1.

Example: Rendering a Web Page Using a Custom Agent

The source for the example below can be found in the file `xmlui.jsp`

In the first part of the example server page we set up error handling, display the copyright notice, and import the referenced packages.

```
<%@ page errorPage="error.jsp" %>
<%--
/*
 * I n Q u i r a  Copyright (c) 2002 - 2006 Inquira, Inc. All rights
 * reserved. Use or distribution without the express written consent of
 * Inquira, Inc. is not permitted and is prohibited by law.
 */
```

```
--%>
<%@ page import="java.io.*,java.util.*" %>
<%@ page
import="javax.xml.transform.*,javax.xml.transform.stream.*,javax.xml.transform.dom.*,org.w3c.d
om.*" %>
<%@ page import="com.inquira.infra.gateway.html13.*,com.inquira.infra.client.*" %>
```

Next, we set up a client object using the IClient interface and initialize a connection through a SOAP gateway.

```
<%!

    private static IClient client;
    private static Object lockObject = new Object();

    static {
        client = null;
    }

%>
<%  //Create an IClient object to communicate with the search back end
    synchronized (lockObject) {
        if (client == null) {
            System.out.println("Initializing Connection with InQuira Gateway");
            IClient configuredClient = null;
            Properties props = new Properties( );

            // Modify the values below to adjust for your environment
            String soapurl = "http://hostname:port/inquiragw/servlet/rpcrouter;
            String soapurn = "urn:inquira";
            String timeout = null;

            // Create, configure, and connect the SOAP client
            configuredClient = new Client( );
            props.setProperty( Client.URN, soapurn );
            props.setProperty( Client.URL, soapurl );
            if( timeout != null ) {
                props.setProperty( Client.TIMEOUT, timeout );
            }

            try {
                configuredClient.setConnectionProperties( props );
                configuredClient.connect( );
            }
            catch( ClientException ex ) {
                ex.printStackTrace( );
              RuntimeException rex = new RuntimeException( "Unable to connect to client.\nReason:
" + ex.toString( ) );
                throw rex;
            }
            }
```

```
            client = configuredClient;
        }
    }
%>
```

Using the XMLAgent subclass of Agent, we get the request parameter that defines how the retrieved data is presented in the user interface, and retrieve the data. Refer to the comments for the switches below to find out what each parameter does.

```
<%
        // Create the XMLAgent that takes the HTTP request parameters
        // and headers and create an Inquira request, call the
        // IClient.process method, and return the Inquira
        // response in a DOM node.
        Agent agent = new XMLAgent( client, request, response, config, request.getSession(true) );

        // Get the mode we are in from the HTTP request parameter
        // called "ui_mode"
        String mode = request.getParameter( Agent.HTTP_PARAM_MODE );
        Object node = null;
        if( mode == null || ( mode = mode.trim( ) ).length( ) == 0 || mode.equals(
Agent.HTTP_PARAM_MODE_INITIAL_SCREEN ) ) {
            // If there was no mode set or it was set to "initial_screen",
            // then we want to display the entry point
            // to the search application
            node = agent.processInitialScreen( );
        } else if( mode.equals( Agent.HTTP_PARAM_MODE_QUESTION ) ) {
            // If mode is set to "question", then we are answering a
            // user's question
            node = agent.processQuestionMode( );
        } else if( mode.equals( Agent.HTTP_PARAM_MODE_NAVIGATE ) ) {
            // If mode is set to "navigate", then we are processing a
            // user changing navigation parameters -
            // by clicking on the facet links
            node = agent.processNavigateMode( );
        } else if( mode.equals( Agent.HTTP_PARAM_MODE_ANSWER ) ) {
            // If mode is set to "answer", then we are processing an
            // answer-based request, such as highlighting
            // or click-through tracking
            node = agent.processAnswerMode( );
        } else if( mode.equals( Agent.HTTP_PARAM_MODE_FEEDBACK ) ) {
            // If mode is set to "feedback", then we are handling the
            // user rating the answers
            node = agent.processFeedbackMode( );
            response.setStatus(204); // No Content response
        } else if( mode.equals( Agent.HTTP_PARAM_MODE_PAGING ) ) {
            // If mode is set to "paging", then we are displaying the
            // prior, current, or next page of answers
            // depending on the direction
```

```
            node = agent.processPagingMode( );
        } else if( mode.equals( Agent.HTTP_PARAM_MODE_GETPAGE ) ) {
            // If mode is set to "get_page", then we get a static
            // page such as the search tips
            node = agent.processGetPage( );
        } else if( mode.equals( Agent.HTTP_PARAM_MODE_LOGIN ) ) {
            // If mode is set to "login", then we process a login request
            node = agent.processLoginMode( );
        } else if( mode.equals( Agent.HTTP_PARAM_MODE_SEARCH_WITHIN ) ) {
            // If mode is set to "search_within", then we process a
            // search within a given document
            node = agent.processSearchWithin( );
        } else {
            // We encountered an unsupported mode
            node = agent.processInvalidMode( mode );
        }
```

If we managed to retrieve some data, we continue by setting up a DOM node and doing the standard transformation normally done in InQuira. Use the DOM node to access the returned XML and substitute your own transformation algorithms to generate output other than HTML.

```
        if( node != null ) {
            // If we got a response, we try to apply the standard XSL
            // transformation to generate HTML
            DOMSource xslIn = new DOMSource( (Node)node );
            StreamResult xslOut = new StreamResult( out );
            agent.assureTemplates( );
            Transformer transformer = agent.getTemplate( "QUESTION_ANSWER"
).newTransformer( );
            transformer.setOutputProperty( OutputKeys.ENCODING, "UTF-8" );
            transformer.transform( xslIn, xslOut );
        }
%>
```