Sterling Commerce
An IBM Company

Selling and Fulfillment Foundation: Customizing User Interfaces for Mobile Devices Guide

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Preface

This manual describes the concepts and procedures for developing mobile device user interface applications.

Intended Audience

This manual is intended for use by those who are responsible for customizing Selling and Fulfillment Foundation.

Structure

This document contains the following chapters:

Chapter 1, "Checklist for Customization Projects"

This chapter describes a checklist of the tasks you need to perform to customize the different components of Selling and Fulfillment Foundation.

Chapter 2, "Planning Custom Interfaces for Mobile Devices"

This chapter describes how to develop and display a custom user interface for the mobile devices.

Chapter 3, "Creating Resources for Mobile Device Interfaces"

This chapter describes how to create custom mobile device resources, such as an entity, a detail view, inner panels, and APIs.

Chapter 4, "Menu Entries and HTML Templates for Mobile Devices"

This chapter descibes how to add a mobile device menu entry and create an HTML Template.

Chapter 5, "Creating JSP Files"

This chapter descibes the JSP file structure and guidelines for naming a JSP file and directory.

Chapter 6, "Style Reference for Mobile Device Interfaces"

This chapter descibes the HTML tags and JavaScript functions that can be used for mobile device interfaces.

Chapter 7, "Programming Standards for Mobile Device Interfaces"

This chapter describes programming standards for mobile device interfaces.

Chapter 8, "JSP Functions for Mobile Device Interfaces"

This chapter describes the various JSP functions that can be used for mobile device interfaces.

Selling and Fulfillment Foundation Documentation

For more information about the Selling and Fulfillment Foundation components, see the following manuals:

- *Selling and Fulfillment Foundation: Release Notes*
- *Selling and Fulfillment Foundation: Installation Guide*
- *Selling and Fulfillment Foundation: Upgrade Guide*
- *Selling and Fulfillment Foundation: Configuration Deployment Tool Guide*
- *Selling and Fulfillment Foundation: Performance Management Guide*
- *Selling and Fulfillment Foundation: High Availability Guide*
- *Selling and Fulfillment Foundation: System Management Guide*
- *Selling and Fulfillment Foundation: Localization Guide*
- *Selling and Fulfillment Foundation: Customization Basics Guide*
- *Selling and Fulfillment Foundation: Customizing APIs Guide*

- *Selling and Fulfillment Foundation: Customizing Console JSP Interface for End User Guide*
- *Selling and Fulfillment Foundation: Customizing the RCP Interface Guide*
- *Selling and Fulfillment Foundation: Customizing User Interfaces for Mobile Devices Guide*
- *Selling and Fulfillment Foundation: Customizing Web UI Framework Guide*
- *Selling and Fulfillment Foundation: Customizing Swing Interface Guide*
- *Selling and Fulfillment Foundation: Extending the Condition Builder Guide*
- *Selling and Fulfillment Foundation: Extending the Database Guide*
- *Selling and Fulfillment Foundation: Extending Transactions Guide*
- *Selling and Fulfillment Foundation: Using Sterling RCP Extensibility Tool Guide*
- *Selling and Fulfillment Foundation: Integration Guide*
- *Selling and Fulfillment Foundation: Product Concepts Guide*
- *Sterling Warehouse Management™ System: Concepts Guide*
- *Selling and Fulfillment Foundation: Application Platform Configuration Guide*
- *Sterling Distributed Order Management™: Configuration Guide*
- *Sterling Supply Collaboration: Configuration Guide*
- *Sterling Global Inventory Visibility™: Configuration Guide*
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- *Selling and Fulfillment Foundation: Catalog Management Concepts Guide*
- *Selling and Fulfillment Foundation: Pricing Concepts Guide*
- *Business Center: Item Administration Guide*
- *Business Center: Pricing Administration Guide*
- *Business Center: Customization Guide*
- *Business Center: Localization Guide*

Conventions

In this manual, Windows refers to all supported Windows operating systems.

The following conventions may be used in this manual:

Convention	Meaning
. . .	Ellipsis represents information that has been omitted.

Convention	Meaning
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/ or \	Slashes and backslashes are file separators for Windows, UNIX, and Linux operating systems. The file separator for the Windows operating system is "\" and the file separator for UNIX and Linux systems is "/". The UNIX convention is used unless otherwise mentioned.
<INSTALL_DIR>	User-supplied location of the Selling and Fulfillment Foundation installation directory. This is only applicable for Release 8.0 or later.
<INSTALL_DIR_OLD>	User-supplied location of the Selling and Fulfillment Foundation installation directory (for Release 8.0 or later). **Note:** This is applicable only for users upgrading from Release 8.0 or later.
<YANTRA_HOME>	User-supplied location of the Sterling Supply Chain Applications installation directory. This is only applicable for Releases 7.7, 7.9, and 7.11.
<YANTRA_HOME_OLD>	User-supplied location of the Sterling Supply Chain Applications installation directory (for Releases 7.7, 7.9, or 7.11). **Note:** This is applicable only for users upgrading from Releases 7.7, 7.9, or 7.11.
<YFS_HOME>	For Releases 7.3, 7.5, and 7.5 SP1, this is the user-supplied location of the Sterling Supply Chain Applications installation directory. For Releases 7.7, 7.9, and 7.11, this is the user-supplied location of the <YANTRA_HOME>/`Runtime` directory. For Release 8.0 or above, the <YANTRA_HOME>/`Runtime` directory is no longer used and this is the same location as <INSTALL_DIR>.

Convention	Meaning
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<ANALYTICS_HOME>	User-supplied location of the Sterling Analytics installation directory. **Note:** This convention is used only in the *Selling and Fulfillment Foundation: Business Intelligence Guide*.
<COGNOS_HOME>	User-supplied location of the IBM Cognos 8 Business Intelligence installation directory. **Note:** This convention is used only in the *Selling and Fulfillment Foundation: Business Intelligence Guide*.
<MQ_JAVA_INSTALL_PATH>	User-supplied location of the IBM WebSphere® MQ Java components installation directory. **Note:** This convention is used only in the *Selling and Fulfillment Foundation: System Manangement and Administration Guide*.
<DB>	Refers to Oracle®, IBM DB2®, or Microsoft SQL Server® depending on the database server.
<DB_TYPE>	Depending on the database used, considers the value oracle, db2, or sqlserver.

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- Sterling Supply Chain Applications is used for Releases 7.9 and 7.11.
- Sterling Multi-Channel Fulfillment Solution is used for Releases 8.0 and 8.2.
- Selling and Fulfillment Foundation is used for Release 8.5.

1

Checklist for Customization Projects

This chapter provides a high-level checklist for the tasks involved in customizing or extending Selling and Fulfillment Foundation.

1.1 Customization Projects

Projects to customize or extend Selling and Fulfillment Foundation vary with the type of changes that are needed. However, most projects involve an interconnected series of changes that are best carried out in a particular order. The checklist identifies the most common order of customization tasks and indicates which guide in the documentation set provides details about each stage.

1. Prepare your development environment

   Set up a development environment that mirrors your production environment, including whether you deploy Selling and Fulfillment Foundation on a WebLogic, WebSphere, or JBoss application server. Doing so ensure that you can test your extensions in a real-time environment.

   You install and deploy Selling and Fulfillment Foundation in your development environment following the same steps that you used to install and deploy Selling and Fulfillment Foundation in your production environment. Refer to Selling and Fulfillment Foundation system requirements and installation documentation for details.

   An option is to customize Selling and Fulfillment Foundation with Microsoft COM+. Using COM+ provides you with advantages such as increased security, better performance, increased manageability of server applications, and support for clients of mixed environments. If

this is your choice, see the *Selling and Fulfillment Foundation: Customization Basics Guide* about additional installation instructions.

2. Plan your customizations

   Are you adding a new menu entry, customizing the Sign In screen and logo, creating new themes, customizing views and wizards, or adding new screens? Each type of customization varies in scope and complexity. For background, see the *Selling and Fulfillment Foundation: Customization Basics Guide*, which summarizes the types of changes that you can make.

   Important guidelines about file names, keywords, and other conventions are found in the *Selling and Fulfillment Foundation: Customization Basics Guide*.

3. Extend the Database

   For many customization projects, the first task is to extend the database so that it supports the other UI or API changes that you make later. For instructions, see the *Selling and Fulfillment Foundation: Extending the Database Guide* which include information about the following topics:

   - Important guidelines about what you can and cannot change in the database.
   - Information about modifying APIs. If you modify database tables so that any APIs are impacted, you must extend the templates of those APIs or you cannot store or retrieve data from the database. This step is required if table modifications impact an API.
   - How to generate audit references so that you improve record management by tracking records at the entity level. This step is optional.

4. Make other changes to APIs

   Selling and Fulfillment Foundation can call or invoke standard APIs or custom APIs. For background about APIs and the services architecture in Selling and Fulfillment Foundation, including service types, behavior, and security, see the *Selling and Fulfillment Foundation: Customizing APIs Guide*. This guide includes information about the following types of changes:

- How to invoke standard APIs for displaying data in the UI and also how to .save the changes made to the UI in the database.
- Invoke customized APIs for executing your custom logic in the extended service definitions and pipeline configurations.
- APIs use input and output XML to store and retrieve data from the database. If you don't extend these API input and output XML files, you may not get the results you want in the UI when your business logic is executing.
- Every API input and output XML file has a DTD and XSD associated to it. Whenever you modify input and output XML, you must generate the corresponding DTD and XSD to ensure data integrity. If you don't generate the DTD and XSD for extended Application XMLs, you may get inconsistent data.

5. Customize the UI

   Sterling Commerce applications support several UI frameworks. Depending on your application and the customizations you want to make, you may work in only one or in several of these frameworks. Each framework has its own process for customizing components like menu items, logos, themes, and etc. Depending on the framework you want, consult one of the following guides:

   - *Selling and Fulfillment Foundation: Customizing Console JSP Interface for End User Guide*
   - *Selling and Fulfillment Foundation: Customizing the Swing Interface Guide*
   - *Selling and Fulfillment Foundation: Customizing User Interfaces for Mobile Devices Guide*
   - *Selling and Fulfillment Foundation: Customizing the RCP Interface Guide* and *Selling and Fulfillment Foundation: Using the Sterling RCP Extensibility Tool Guide*
   - *Customizing the Web UI Framework Guide*

6. Extend Transactions

   You can extend the standard Selling and Fulfillment Foundation to enhance the functionality of your implementation of Selling and Fulfillment Foundation and to integrate with external systems. For background about transaction types, security, dynamic variables, and extending the

Condition Builder, see the *Selling and Fulfillment Foundation: Extending Transactions Guide Selling and Fulfillment Foundation: Extending the Condition Builder Guide* . These guides includes information about the following types of changes:

- How to extend Selling and Fulfillment Foundation Condition Builder to define complex and dynamic conditions for executing your custom business logic and using a static set of attributes.
- How to define variables to dynamically configure properties belonging to actions, agents, and services configurations.
- How to set up transactional data security for controlling who has access to what data, how much they can see, and what they can do with it.
- How to create custom time-triggered transactions. You can invoke and schedule these custom time-triggered transactions in much the same manner as you invoke and schedule Selling and Fulfillment Foundation standard time-triggered transactions. Finally, you can coordinate your custom, time-triggered transactions with external transactions and run them either by raising an event, calling a user exit, or invoking a custom API or service.

7. Build and deploy your customizations or extensions

   After performing the customizations that you want, you must build and deploy your customizations or extensions. First, build and deploy these customizations or extensions in the test environment for verification. When you are ready, repeat the same process to build and deploy your customizations and extensions in the production environment. For instructions, see the *Selling and Fulfillment Foundation: Customization Basics Guide* which includes information about the following topics:

   - How to build and deploy standard resources, database, and other extensions (such as templates, user exits, java interfaces).
   - How to build and deploy Enterprise-Level extensions.

2

Planning Custom Interfaces for Mobile Devices

2.1 Differences between Console User and Mobile Device Interfaces

Selling and Fulfillment Foundation enables you to develop and display a custom user interface for the mobile devices used in warehouse operations.

Mobile device user interface extensibility is accomplished through scripts that determine how the user interface renders the screen and passes data.

Before beginning, you need to understand how to develop HTML, JSP, and XML components, how to use APIs, and how to use the Selling and Fulfillment Foundation Console and the Applications Manager user interfaces.

When customizing the interface, copy the standard resources of Selling and Fulfillment Foundation and then modify your copy, or create a completely new view. Do not modify the standard resources of Selling and Fulfillment Foundation.

Note that the mobile device user interface differs from the Console user interface in the following ways:

- Mobile device screens use separate architecture for search and list views. If you need search view and list views functionality, model them as detail views.
- Mobile device screens can have only one detail view. Each detail view can contain only one inner panel.

- A mobile device inner panel cannot have any actions or icons.

The APIs return the data that needs to be displayed. For information on functions specific to mobile devices that are used within the JSP files, see Appendix D, "Mobile User Interface Extensibility Reference".

Customizing the mobile device user interface is accomplished using the Applications Manager user interface. For more information about this UI, see the *Selling and Fulfillment Foundation: Application Platform Configuration Guide*.

2.2 Guidelines for Smooth Upgrades and Maintenance

- Do not change the resource definitions of any of the resources shipped as part of the standard default configuration. Either make a copy through the Applications Manager and then change the copy or create your own new views.
- Do not change any of the JSP files, JavaScript files and icon JAR files that are supplied by Selling and Fulfillment Foundation. If you do, your changes may be lost during upgrades.
- When creating new views, consider issues regarding ease of maintenance as well as ease of creation. When you create a new view, inner panel, and so forth, it is possible to link to the JSPs supplied by Selling and Fulfillment Foundation. But in future releases, Selling and Fulfillment Foundation may add more resources to these JSP, which means you must monitor software changes and update your configuration to account for these changes.
- Build in Usability : Any new views you develop should look and behave like the product views, so before you begin developing, gain an understanding of how the default views behave.
- Prepare Your Development Environment: In order to start the customization process, you must perform prepare the development environment to accommodate for development and testing of the Selling and Fulfillment Foundation mobile user interface changes.

2.3 Design Guidelines for Mobile Device Screens

In order to optimize the display of data and execution of transactions, design simple screens and simple transactions, using the following rules:

- Avoid placing a lot of information into a small space. This ensures more rapid transaction time and enables the end user to parse data visually more quickly.
- Because of the reduced screen size, if you need to display a lot of data, the display of data may need to be altered to accommodate the amount of data. In this case, the data must be persisted from one screen to the next before finally being posted. For small screens, use the TEMPQ utilities to pass data between screens.
- The TempQ utilities enables you to persist and pass data from one screen to the next. For information on the TempQ utilities, please see Appendix D, "Mobile User Interface Extensibility Reference".
- Provide text on one line and the data field on another line to accommodate for internationalization requirements.
- Validate fields only when necessary in order to optimize transaction execution time.
- Choose fast or templatized APIs that return exactly the correct type of information needed in order to optimize transaction execution time.

2.4 Planning Mobile Device Screen Size

You must keep the following things in mind when defining the screen size dimensions for a mobile device:

- Restrict the screen size to 8 lines X 24 (or 22) characters per line. This ensures that your custom screen also displays correctly on a VT220 terminal.
- A mobile device screen can contain only table.
- A mobile device screen can handle a combined total of the following hidden and displayed fields as described in Table 2–1, "Mobile Device Screen Size Specifications".

Table 2–1 Mobile Device Screen Size Specifications

Field	Maximum Size
Text and hidden fields	15
Labels and protected fields	15
Command buttons	5

- When the maximum allowed size for a given field is violated by a user, (for example, when a user enters 20 hidden fields), the following error message is displayed: "An error was encountered while running this program: Invalid procedure call or argument".
- Draw a layout of each screen. For example, creating inventory screens requires an inventory inquiry screen and an inventory detail screen.

Figure 2–1 Inventory Inquiry Screen

1	12345678901234567890
1	Inventory Inquiry
2	Enterprise [ ]
3	Item ID [ ]
4	Desc
5	Product Class [ ]
6	UOM [ ]
7	
8	
	[Back] [Next View] [Inquire]

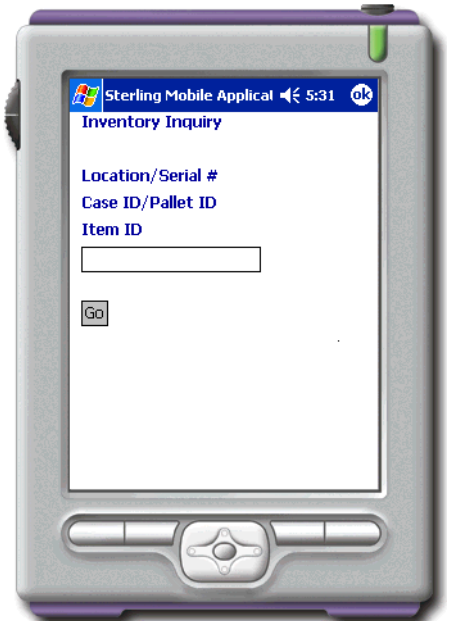
Figure 2–2 Inventory Detail Screen

2	12345678901234567890
1	Enterprise [ ]
2	Reference [ ]
3	Item ID [ ]
4	Desc
5	Product Class [ ]
6	UOM [ ]
7	Quantity 99999999999
8	
	[Back]

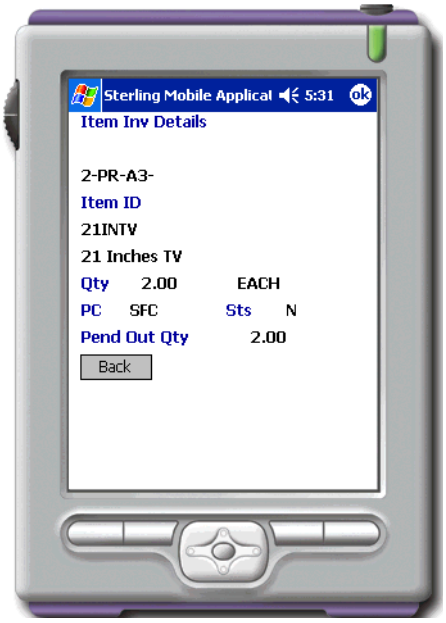
Note the use of fixed width font while drawing the screen layouts. The buttons are not counted while considering the 8-row limit.

Figure 2–3 Inventory Inquiry Screen and Inventory Detail Screen

Screen 1: Inventory Inquiry Screen



Screen 2: Inventory Detail Screen



In this example, the `getItemList()` API fetches item details based on the information submitted on the Inventory Inquiry Search Screen, and `getATP()` API fetches inventory details for the item on the Inventory Inquiry Detail screen.

- List the APIs that must be called when each screen is navigated to. This should include the entire API input that is passed and the API template that is used for filtering the API output, if applicable.

2.5 Passing Data Between Mobile Device Screens

Because of the small screen size, the data may need to be persisted from one screen to the next before finally being posted. When passing data between screens, you can either use hidden text or the TempQ utilities. We recommend the usage of TempQ. A TempQ stores the name/value pair information on one page in the session and provides for accessor methods on the subsequent pages. For details on these utilities, see Appendix D, "Mobile User Interface Extensibility Reference".

2.6 Error Handling for Mobile Devices

Error handling is taken care of by the utility method getError XML as shown in the `rfutil.jspf` file. For information on the getError XML, see Section D.3.4, "deleteFromTempQ" on page 7.

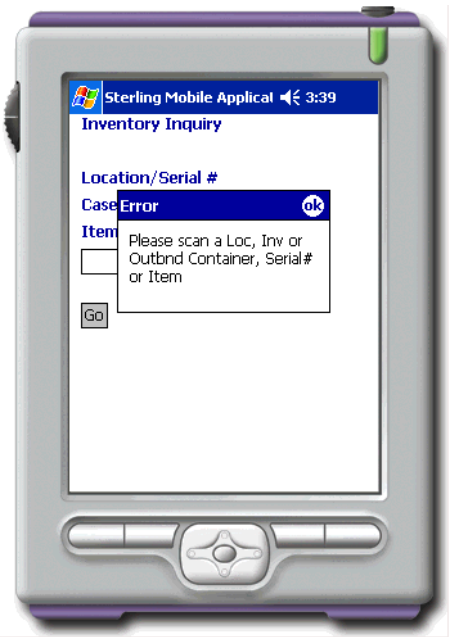
Validations performed by tabbing out of a field or by clicking a button may lead to an error. These errors are displayed in a standard error XML in the response output stream:

```
<errors>
    <error errortxt="errorDesc" focus="errorField"/>
</errors>
```

See the following Inventory Inquiry error message example.

Figure 2–4 Error Messages Displayed

Error Condition 1:
Item ID is not entered



3

Creating Resources for Mobile Device Interfaces

3.1 Creating Resources in the Applications Manager

Mobile device screens are composed of screen resources, such as an entity, a detail view, inner panels, and APIs. These resources define the screen look and feel, screen behavior, and screen flow.

To create custom mobile device resources:

Select Applications > Application Platform > Presentation > Resources > Mobile Application > Entities as described in the *Selling and Fulfillment Foundation: Application Platform Configuration Guide*.

Configure the resources described in Table 3–1, "Mobile Device Resources".

Table 3–1 Mobile Device Resources

Resource	Description
Screen Entity	Controls access to transactions. It also provides the starting point (JSP name).
Detail View	Mobile device screens are modeled as details views. A screen can have only one detail view. Each detail view can contain only one inner panel. A screen can contain only table.
Inner Panel	Mobile device inner panels cannot have any actions or icons.
APIs	Required APIs can be defined under the APIList for the innerpanel.

3.2 Inventory Inquiry Resources in the Applications Manager: An Example

The Creating Inventory Inquiry screens requires the following user interface resources:

- A screen entity called rfinventory
- Detail view called rfinventoryD1
- Inner panel called rfinventoryIP1
- `getItemDetails()` API called rfinventoryD1IP1API

These resources are detailed in the following tables.

Figure 3–1 Mobile Device Screen Entity Resource

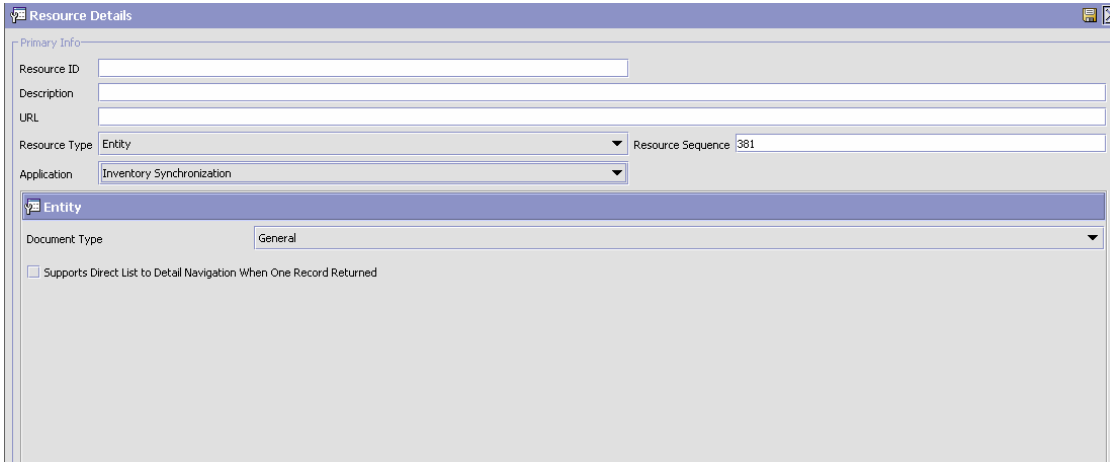


Table 3–2 Mobile Device Screen Entity Resource Values

Name	Value
Resource ID	rfinventory
Description	RF_Inventory
Resource Type	Entity
Resource Sequence	(Default Suggested Value)

Table 3–2 Mobile Device Screen Entity Resource Values

Name	Value
Application	Warehouse Management
Document Type	General

Figure 3–2 Mobile Device Screen Detail View

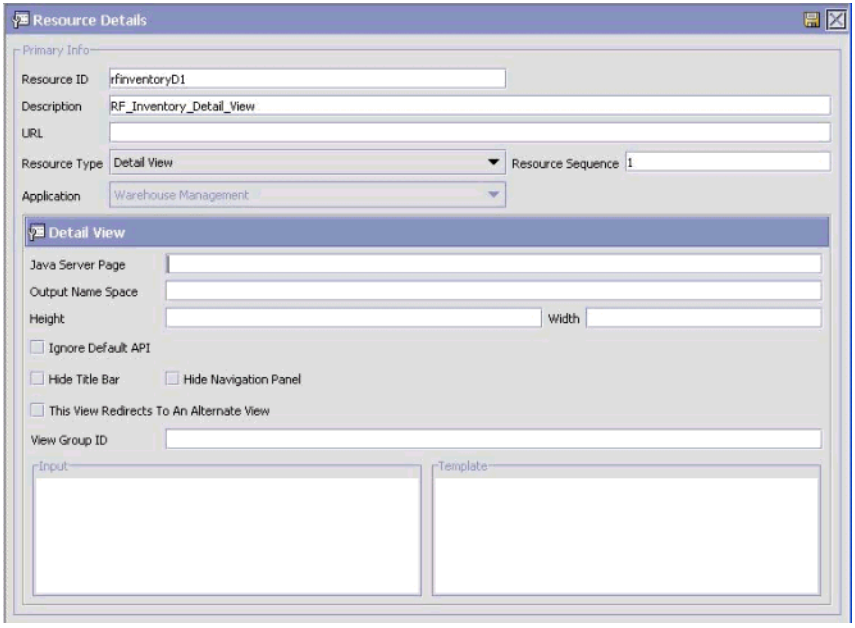


Table 3–3 Mobile Device Screen Detail View Resource Values

Name	Value
Resource ID	rfinventoryD1
Description	RF_Inventory_Detail_View
Resource Type	Detail View
Resource Sequence	(Default Suggested Value)
Application	Warehouse Management

Figure 3–3 Mobile Device Screen Inner Panel Resource

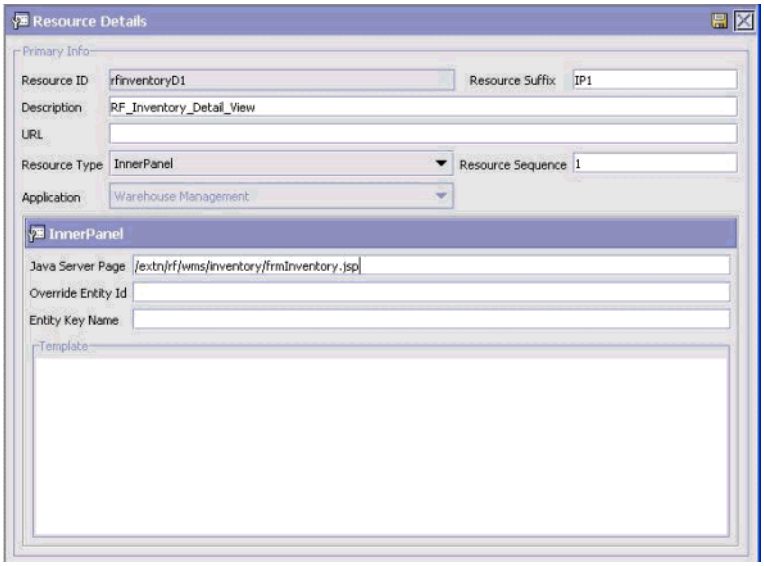


Table 3–4 Mobile Device Screen Inner Panel Resource Values

Name	Value
Resource ID	rfinventoryD1IP1
Description	RF_Inventory_Inner_Panel
Resource Type	Inner Panel
Resource Sequence	(Default Suggested Value)
Application	Warehouse Management
Java Server Page	/extensions/global/webpage/rf/wms/inventory/frmInventory.jsp

Figure 3–4 Mobile Device Screen API Resource

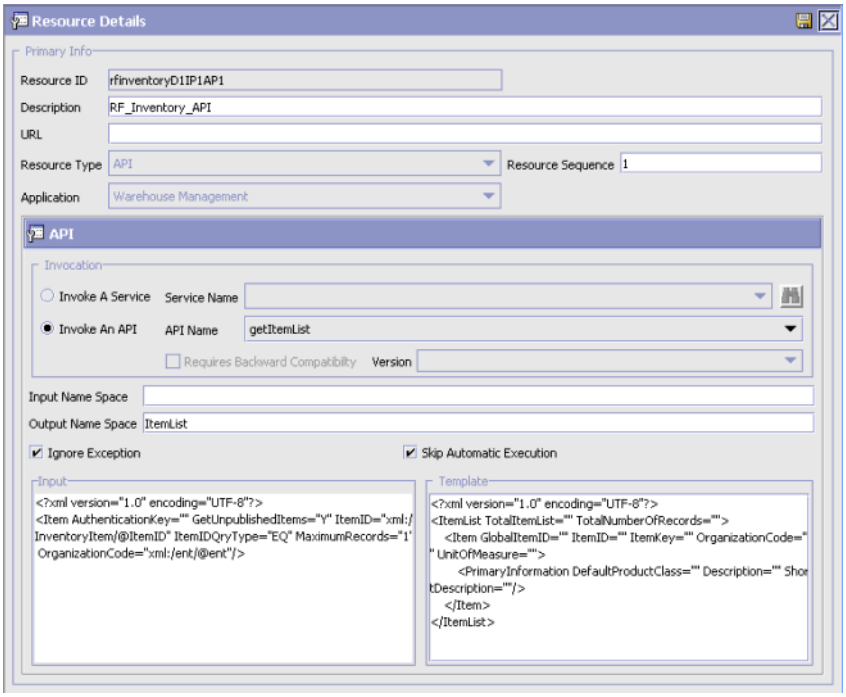


Table 3–5 Mobile Device Screen API Resource Values

Name	Value
Resource ID	rfinventoryD1IP1AP1
Description	RF_Inventory_API
Resource Type	API
Resource Sequence	(Default Suggested Value)
Application	Enter Warehouse Management.
Invoke an API	Select this radio button.
API Name	getItemList
Output Name Space	ItemList
Ignore Exception	Select this checkbox
Skip Automatic Execution	Always select this checkbox when defining a mobile device screen API resource.

Table 3–5 Mobile Device Screen API Resource Values

Name	Value
Input	<?xml version="1.0" encoding="UTF-8"?><Item AuthenticationKey="" GetUnpublishedItems="Y" ItemID="xml:/InventoryItem/@ItemID" ItemIDQryType="EQ" MaximumRecords="1" OrganizationCode="xml:/ent/@ent"/>
Template	<?xml version="1.0" encoding="UTF-8"?><ItemList TotalItemList="" TotalNumberOfRecords=""> <Item GlobalItemID="" ItemID="" ItemKey="" OrganizationCode="" UnitOfMeasure=""> <PrimaryInformation DefaultProductClass="" Description="" ShortDescription=""/> </Item></ItemList>

4

Menu Entries and HTML Templates for Mobile Devices

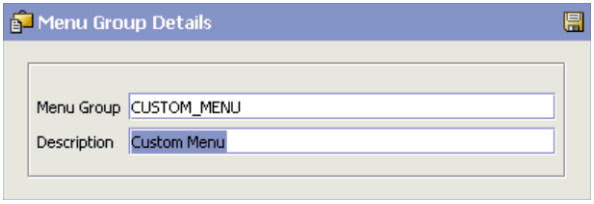
4.1 Adding a Menu Entry

This section explains how to add a mobile device menu entry.

To create a mobile device menu entry:

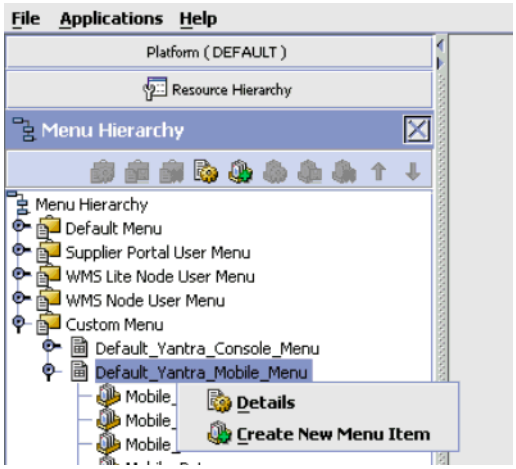
1. Create a menu entry using the Menu Applications Manager. On saving the screen, a new Menu Group called “Custom Menu” is created.

Figure 4–1 Menu Group Details Screen



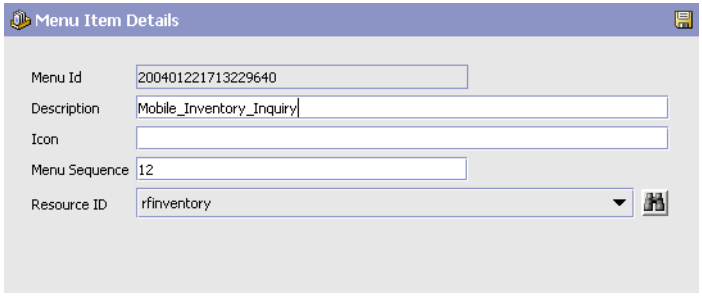
2. Right-click Custom Menu > Default_Yantra_Mobile_Menu > Create New Menu Item and select Details.

Figure 4–2 Menu Hierarchy Screen



3. Add a new Menu Item with the description Mobile_Inventory_Inquiry the Resource ID `rfinventory` and the menu sequence as suggested.

Figure 4–3 Menu Item Details Screen



4. Create a bundle property for Mobile_Inventory_Inquiry with a value 'Inventory Inquiry' in the `<INSTALL_`

DIR>/extensions/global/resources/extnbundle.properties file. This creates a mobile device menu option called Inventory Inquiry.

Note: Ensure that the following file does not exist:

<INSTALL_DIR>/resources/extn/extnbundle.properties

This file must be removed because it will conflict with the extensions build process for bundle entries.

Figure 4–4 Mobile Application Menu Screen

Choosing this Menu option eventually invokes the JSP defined in the inner panel associated with this entity.

For example, in the rfinventory UI entity, the /extensions/global/webpages/rf/wms/inventory/fmInventory.jsp file relative to the Selling and Fulfillment Foundation base URL is invoked.

4.2 Creating an HTML Template

A template HTML enables rendering the look and feel of the mobile device screen. A template HTML defines which fields are included and how they are laid out. Each screen requires a template HTML file. The template HTML uses some custom mobile device tags in addition to the standard HTML tags.

The template HTML must adhere to the XSD defined in the `<INSTALL_DIR>/repository/xapi/template/merged/mobilescreens/rf.xsd` style sheet.

All template HTML files must reside in the `<INSTALL_DIR>/extensions/global/template/mobilescreens/<uientity>` directory. The name `<uientity>` refers to the screen entity resource that needs to be created for a mobile transaction.

For standard Selling and Fulfillment Foundation mobile UI screen tags, see Appendix D, "Mobile User Interface Extensibility Reference"

The template HTML files for the inventory inquiry scenario are available for you to copy and reuse from the `<INSTALL_DIR>/xapidocs/code_examples/rfinventory/` directory.

5

Creating JSP Files

5.1 JSP File Structure

The JSP files call the appropriate API (if needed), pick up the appropriate template XML and pass the values returned by the API as data to the template XML.

A separate JSP file must be written for ***each*** of the following screen components:

- Screen - for invoking the HTML template and rendering the screen on the Selling and Fulfillment Foundation mobile client.
- Validation - for performing field level validations.
- Command button - for performing actions on clicking of the command button.

A JSP file for a mobile UI screen typically contains three sections, but not all bullets apply to every mobile JSP file:

Section 1

- Extracts values from the pageContext or Session.
- Performs setAttribute for some of the input bindings.

Section 2

- Calls an API using callAPI.
- Processes logic for the API output.

Section 3

- Sends Form or Forward Page

- Sends Error

The example JSP files for the inventory inquiry scenario are available for you to copy and reuse from the <INSTALL_DIR>/xapidocs/code_examples/rfinventory/ directory.

5.2 JSP File Name and Directory Guidelines

When naming JSP files for mobile devices, use the following rules:

- The starting JSP file can have any name but the same name must be defined while adding the inner panel for the screen entity.
- The validation JSP file name syntax must be formName + "Val" + fieldname + ".jsp" format (for example, frmSearchValtxtItemId.jsp is invoked for validating the txtItemId field on the tab out of the txtItemId field in the frmSearch form).
- The name of the JSP being called on the click of a button must be named after the value of the action property in the URL. For example, if button has the URL value of /console/rfinventory.ppc?action=frmSearchUpdCmdInquire, then the JSP being invoked is named as frmSearchUpdCmdInquire.jsp.
- All JSPs must be added to the <INSTALL_DIR>/extensions/global/webpages/rf/wms/<uientity> directory, (for example, <INSTALL_DIR>/extensions/global/webpages/rf/wms/inventory/frmInventory.jsp).
- These JSPs use common utility methods as defined in the <INSTALL_DIR>/repository/eardata/platform/war/yfc/rfutil.jspf file.

6

Style Reference for Mobile Device Interfaces

The style reference helps you maintain consistency and enables easy code reusability.

6.1 HTML Tags for Mobile Device Interfaces

The Selling and Fulfillment Foundation mobile UI uses the following HTML tags:

Table 0–1 Mobile Device Screen HTML Tags

Tag	Valid values/Detail
type	Valid values are: text, hidden, or button.
subtype	Text type tags use the following values: • Label - Static text. • ProtectedText - Non-editable input. • Text - Input text box. Hidden type tags use the value Hidden. Button type tags use the following values: • Command - HTML button. • CommandLogout - Logs the user out and displays the login prompt. • CommandBack - Switches to the previous view. • CommandNextView - Switches to the next view.

Table 0–1 Mobile Device Screen HTML Tags

Tag	Valid values / Detail
name	Name of the field. Cannot contain spaces.
value	Value of the field (Internationalized string from the resource bundle)
size	Length of the field.
maxlen	Maximum length of the field.
row	Row in which the field should appear.
col	Column in which the field should start.
validate	Input data validated by the server. Valid values are: • Always - validate input data in all cases. • True - validate input data only if the old value if different from the new value. • False - do not validate input data.
mandatory	Field usage validated by the server. Valid values are: • True - the user is required to specify a value for the field. • False - the user is not required to specify a value for the field.
tag	Binding for the field recognized by infrastructure. The tag syntax is "binding=x", where 'x' is an XML binding (similar to the ones in Console screens).
url	Specified only for "button/Command" field type/subtype. If set, the request is forwarded to the value of this attribute. It should always be of the form `target + "?action=" + calledFormName` where target is the values of attribute "target" in the "form" element of the HMTL while calledFormName is the name of the JSP to be invoked without the ".jsp" extension.

6.2 JavaScript Functions for Mobile Device Interfaces

The Selling and Fulfillment Foundation mobile UI screens use the JavaScript functions listed in the `<INSTALL_DIR>/repository/eardata/platform/war/yfcscripts/mobile.js` file.

The Selling and Fulfillment Foundation mobile UI can use any of the Console functions if necessary.

7

Programming Standards for Mobile Device Interfaces

7.1 JSP File Standards for Mobile Device Interfaces

Although HTML code is embedded in Java Server Pages, strive to write JSP code that is easily readable. If you require some special XML manipulation that cannot be incorporated in the APIs, include a separate JSP file, so that HTML tags and Java code do not become mixed together.

Use the following standards when writing JSP files:

- Tab spacing - Set the editor tab spacing to 4.
- JavaScript files - Do not include any JavaScript in the JSP file. Put all JavaScript into a separate JS file.
- HTML tags - Type all HTML tags and attributes in lowercase letters.
- HTML attributes - Enclose all HTML element attribute values in double quotes. Single quotes and no quotes may work, but the standard is to use double quotes.
- HTML tables - Strictly adheres to XSD defined.
- Tags - Close all tags, whether required or not.
- Comments - Enclose all comments in the following manner: <%/*.....*/%>

> **Tip:** When finished coding a form, open it in any visual HTML editor to validate that the HTML is well-formed.

7.2 Internationalization Standards for Mobile Device Interfaces

The Presentation Framework enables you to write an internationalized application by providing the following features that can be customized to be *locale-specific*:

- i18n JSP tag for literals
- Server-side error messages

7.3 Validating HTML Files for Mobile Device Interfaces

Validate your HTML files. You can use any commercial software package or free, online application, such as the World Wide Web Consortium (W3C) HTML Validator at http://validator.w3.org/. As an alterative, when you finish coding a form, you can open it in any visual HTML editor to validate that the HTML is well-formed.

Additionally, validate the HTML files against the XSD files.

8

JSP Functions for Mobile Device Interfaces

8.1 JSP Functions Used for Mobile Device Interfaces

You can extend a mobile device interface by including any of the functions listed in <INSTALL_DIR>/repository/eardata/platform/war/yfc/rfutil.jspf file in your JSP file. These functions are listed in alphabetical order.

8.2 addToTempQ

This mobile device JSP function adds the keyName and keyValue pair to TempQ in order to persistence data across JSPs. The TempQ utilities store name/value pair information on one page in the session and provide methods for accessing them on the subsequent screens.

This function also enables support of multiple duplicate key names.

Syntax

public void addToTempQ (String keyName, String keyValue, boolean allowDuplicates) throws Exception

public void addToTempQ (String keyName, String keyValue, Map m, boolean allowDuplicates) throws Exception

Input Parameters

keyName - Required. Name of the key to be stored in the TempQ.

keyValue - Required. Value of the key to be stored in the TempQ.

allowDuplicates - Required. Determines whether or not duplicate objects are allowed to be added to the TempQ.

m - Optional. Enables you to provide a map of name/value pairs in a java.util.map.

Example

The following example shows how the addToTempQ function can be used when multiple cases have to be scanned and multiple CaseIDs have to be stored in a TempQ:

```
addToTempQ("Case", "Case", caseMap, true);
```

8.3 clearTempQ

This mobile device JSP function clears the TempQ. This is the first function to invoke before persisting any information in the TempQ. The TempQ utilities store name/value pair information on one page in the session and provide methods for accessing them on the subsequent screens.

Syntax

public void clearTempQ() throws Exception

Input Parameters

None.

Example

The following example shows how this function can be used to clear the TempQ:

```
clearTempQ();
```

8.4 deleteAllFromTempQ

This mobile device JSP function deletes entries from TempQ for a given keyName. Use this after an exception to clear CaseIds stored so far.

The TempQ utilities store name/value pair information on one page in the session and provide methods for accessing them on the subsequent screens.

Syntax

public void deleteAllFromTempQ(String keyName) throws Exception

Input Parameters

keyName - Required. This is the key for which TempQ entries are deleted.

Example

The following example shows how the `deleteAllFromTempQ` function can be used to remove all TempQ entries that correspond with the keyName `CaseScanned`:

```
deleteAllFromTempQ("CaseScanned");
```

8.5 deleteFromTempQ

This mobile device JSP function deletes the TempQ entry for a given keyName and keyValue pair.

The TempQ utilities store name/value pair information on one page in the session and provide methods for accessing them on the subsequent screens.

Syntax

public void deleteFromTempQ(String keyName, String keyValue) throws Exception

Input Parameters

keyName - Required. Name of the key in the TempQ that requires deletion.

keyValue - Required. Value of the key in the TempQ that requires deletion.

Example

The following example shows how the `getLocale` function can be used in conjunction with the getDoubleFromLocalizedString function:

```
deleteFromTempQ("Case","Case");
```

8.6 getErrorXML

This mobile device JSP function returns an XML representation of error. The mobile device interprets this XML and renders an error page.

Syntax

public String getErrorXML(String error, String errorField)

public String getErrorXML(String error, String errorField, String severity)

Input Parameters

error - Required. Error description for the error to be shown to the user. This is usually derived by invoking the `checkForError()` function.

errorField - Required. Form field where the focus must be transferred to on clearing the error page.

severity - Optional. Displays the degree of error present. Recommended values in ascending order are: info, error, warning.

Example

The following example shows how this function can be used to get the error XML for rendering an error message on a mobile UI screen:

```
errorXML=getErrorXML(errorDesc, errorfield)
```

8.7 getField

This mobile device JSP function is used in conjunction with the `getForm()` function.

Syntax

public YFCElement getField(YFCDocument formDoc, String fieldName) throws Exception

Input Parameters

formDoc - Required. Name of the YFCDocument from which the element must be extracted.

fieldName - Required. Name of the form field for which the other attributes need to be set.

Example

The following example shows the getField function.

Consider a form with formName as formName. The following code creates a YFCDocument from the XHTML form:

```
YFCDocument ydoc=getForm(formName);
```

Prior to setting the attributes of the form for a specific element, getField can be called as:

```
YFCElement dropoffLocationElem = getField(ydoc,"lblDropoffLocation");
```

To set the type and subtype attributes for the dropoffLocationElem, use:

```
dropoffLocationElem.setAttribute("type","hidden");
dropoffLocationElem.setAttribute("subtype","Hidden");
```

8.8 getForm

This mobile device JSP function reads the XHTML form for a given form name and returns a YFCDocument. The currentEntity name is prefixed to the formname and .html is suffixed. It looks for the file in the <INSTALL_DIR>/repository/xapi/template/merged/mobilescreens/ directory.

The getForm() function is always used in conjunction with the getField() function.

Syntax

public YFCDocument getForm(String formName) throws Exception

Input Parameters

formName - Required. Name of the XHTML form.

Example

The following example shows how this function can be used to return a YFCDocument for the form "formName":

```
YFCDocument ydoc=getForm()
```

0.0.1 getStoredElement

This mobile device JSP function returns the XML Element for all TempQ entries. Each keyName and keyValue entry can be obtained by traversing the Element.

Syntax

private YFCElement getStoredElement(YFCDocument ydoc, String keyName, String keyValue) throws Exception

Input Parameters

ydoc - Required. YFCDocument representation of the XHTML form.

keyName - Required. Name of the key in the TempQ.

keyValue - Required. Value of the key in the TempQ.

Example

The following example shows the `getStoredElement` function:

```
YFCElement criteria = getStoredElement(getTempQ(),"Criteria", "criteria");
```

8.9 getTempQ

This mobile device JSP function retrieves the TempQ document object from Session. If a TempQ document does not exist, this function creates one. Since the return type of this function is YFCDocument, it is used to get a handle to the TempQ and thereafter is used to get its elements or attributes for some of its elements.

The TempQ utilities store name/value pair information on one page in the session and provide methods for accessing them on the subsequent screens.

Syntax

public YFCDocument getTempQ() throws Exception

Input Parameters

None.

Example

The following example shows how this function can be used to first get the TempQ documents and then later to get the node list for elements with the tag name "LPN":

```
YFCNodeList lpnlist=()((getTempQ()), getElementsByTagName("LPN"));
```

8.10 getTempQValue

This mobile device JSP function returns the value of the TempQ for a specific key. The TempQ utilities store name/value pair information on one page in the session and provide methods for accessing them on the subsequent screens.

Syntax

private String getTempQValue(String keyName) throws Exception

Input Parameters

keyName - Required. Name of the key for which the TempQ value is to be returned.

Example

The following example shows how the `getTempQValue` function can be used to return the keyValue corresponding to the `CaseScanned` key from the TempQ:

```
getTempQValue("CaseScanned");
```

8.11 replaceInTempQ

This mobile device JSP function replaces the value in TempQ for a given key. The TempQ utilities store name/value pair information on one page in the session and provide methods for accessing them on the subsequent screens.

Syntax

public void replaceInTempQ(String keyName, String keyValue) throws Exception

public void replaceInTempQ(String keyName, String keyValue, String newKeyValue) throws Exception

public void replaceInTempQ(String keyName, String keyValue, Map m) throws Exception

Input Parameters

keyName - Required. Name of the key in the TempQ that is being replaced.

keyValue - Required. Value of the key in the TempQ that is being replaced.

newKeyValue - Optional. The new value of the key in TempQ that replaces the old value.

m - Optional. Map that should replace the existing keyValue.

Example

The following example shows how this function can be used to change the value of RecordCount from "1" to "resultMap":

```
replaceInTempQ("RecordCountResult","1",resultMap);
```

8.12 resetAttribute

This mobile device JSP function removes the named attribute from request and PageContext.

> **Note:** It is a good coding practice to reset an attribute before using it in the code.

Syntax

public void resetAttribute(String name)

public void resetAttribute(String name, Object value)

Input Parameters

name - Required. The name of the request attribute that needs to be reset.

value - Optional. The value of the request attribute that the attribute should be reset to.

Example

The following example shows how the `restAttribute` JSP function removes the named attribute from request and PageContext:

```
resetAttribute("TaskList","");
```

8.13 sendForm

This mobile device JSP function posts an HTML form and provides focus on a specific field on a subsequent JSP form. Three versions of syntax enable you to customize how data should display.

Syntax

public String sendForm(String formName, String focusField) throws Exception

public String sendForm(String formName, String focusField, boolean sendData) throws Exception

public String sendForm(YFCDocument formDoc, String focusField, boolean sendData) throws Exception

Input Parameters

formDoc - Required. Either formName of formDoc must be provided.

formName - Required. Either formName of formDoc must be provided.

focusField - Required. Form field where the focus must be transferred to in the invoked JSP.

sendData - Optional. Valid values: true and false.

Example

The following example shows how the `sendForm` function can be used so that the form corresponding to the YFCDocument ydoc is posted. On invocation of the subsequent JSP, the focus is transferred to the txtLocationId field and data is posted.

```
sendForm(ydoc, "txtLocationId", true)
```

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