



IBM Maximo Asset Management

QBR (Ad Hoc) Reporting and Report Object Structures

This document provides details for the Maximo® 7.1.1 through 7.1.1.5 Releases of Ad Hoc Reporting known as Query Based Reporting (QBR). Information on the Maximo 7.1.1.6 and later versions is contained in a separate document downloadable from here <http://ibm.co/NfUcOV>

This guide reviews the QBR functionality and its process flow. It also details how users can Create and Execute Ad Hoc reports. It concludes with information on the setup work involved in enabling Ad Hoc reports, including administration and how to enable Report Object Structures.

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Query Based Reports Overview

Query Based Reports (QBR) are enabled in V7 to meet the Ad-Hoc Reporting needs of users. QBRs enable users to create their own unique report by selecting columns, specifying sorting and grouping, and the query the report will run against. Once the user saves the report, this information is fed through an API to create an xml report design file, which is then executed thru the BIRT Report Engine.

This functionality is intended to enable users to create their own custom reports. This is critical for many reasons, including

- Enables users to quickly create their own reports for their unique business needs
- Does not require technical, development skills, like Java, to create the report
- Does not consume development hours in creating and maintaining large numbers of unique reports, which may only be used by a very small number of users

QBR's are often referred to as 'Ad Hoc' Reports, and the terminology is used interchangeably in this document. However, QBR's are different than traditional, enterprise reports for the reasons listed below.

How they are developed

Enterprise reports are developed by a developer in the BIRT Designer, versus QBR Reports are initiated by a user and created 'On the Fly' within the various applications.

Who uses them

Enterprise reports are developed for a large number of users, and are enabled for quick access. QBR reports are developed for a single user or business case, and are not designed for mass distribution.

Their complexity

Enterprise reports often involve complex sql, which has been optimized for performance, whereas QBR reports typically involve only single or few table joins.

Who has the ability to delete them

Enterprise reports can only be deleted by an administrator who has access to the Report Administration application, or the database. QBRs can be deleted either by the user who created the report, or by the administrator in the Report Administration application.

The Type of Security they have

Enterprise reports have group level security, where groups can be granted access at either an individual report level, or an application level. QBRs however are unique because they may be for a user's individual business needs, which may not want to be shared with others. Because of this requirement, QBR's utilize user level report security.

*Note: For best practice information on enabling QBR report access for your users, see the section titled 'Best Practices - QBR Security Access' below.

Both Enterprise reports and Ad Hoc reports have their unique, individual business needs that they must meet. Enterprise reports are intended for access by high volumes of users, and their focus is on heavily formatted, detailed reports with complex sql code optimized for performance. Conversely, Ad Hoc reports are intended for access by a small number of users to meet their individual business needs. These use cases are often referred to as 'one off' business needs. Additionally, Ad Hoc reports are not optimized for formatting, as the assumption is that the user will determine the formatting of his report through individualized grouping and sorting, or exporting of the data to excel.

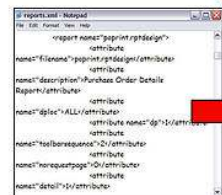
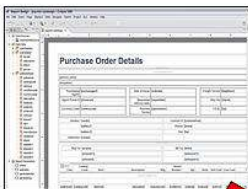
Because of their unique business needs, the process to develop an Enterprise report from an Ad Hoc report differs significantly.

The diagram below shows the stages that an Enterprise report goes through from Report Development, Administration and then Execution by a user. (Each of these steps is detailed in the V7 Report Feature Guide.)

Enterprise Report

Development

BIRT Designer



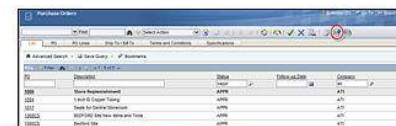
Administration

V7 Report Admin



Execution

Single Report



The Report Design, along with its properties and xml file, are created in the BIRT Report Designer by a report developer. These files are then imported into the database. An administrator then utilizes the Report Administration application to set security access, and modify any property or application settings. Then, in the last stage, the user executes the report, and a single, highly formatted report is generated.

Ad Hoc reports have a significantly different reporting process. Since the goal of Ad Hoc reporting is to enable the user to create his own report - meaning he determines what fields/sorting/grouping etc are included in his report. This frees up significant development time as the developer no longer is required to produce multiple design files for each individual report design.

The diagram below shows the stages that an Ad Hoc or QBR report goes through from Report Development and then Creation and Execution by the user. Please note that no Report Administration is required in these stages - the user simply creates his own individual reports on the fly.

Ad Hoc (QBR) Report

Development

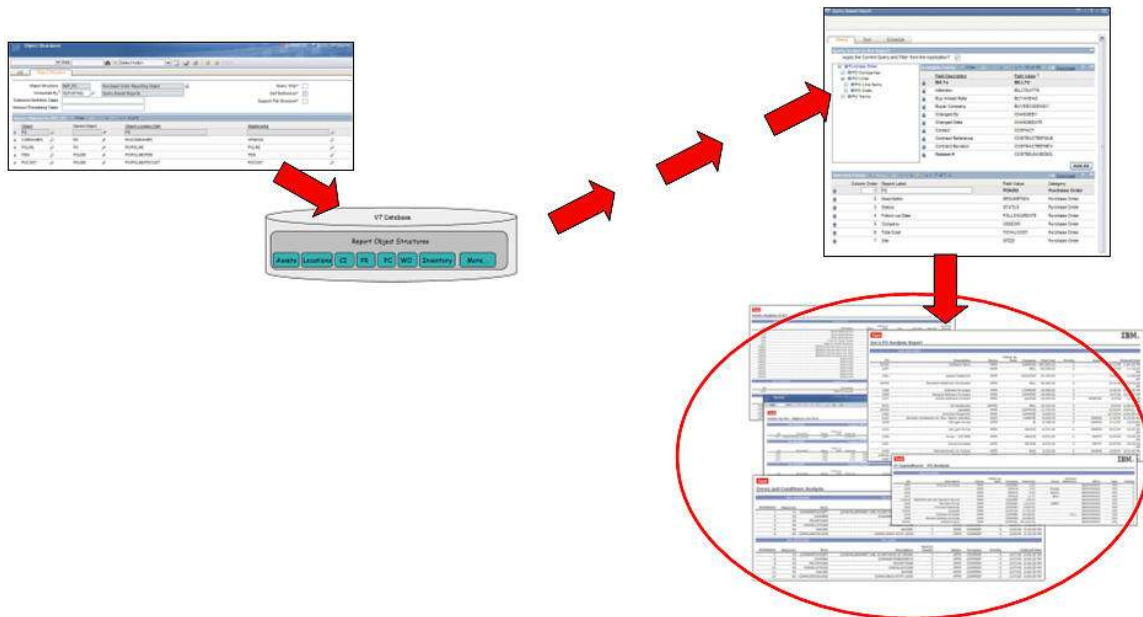
Obj Structure App

Administration

V7 Report Admin

Execution

Multiple Reports



The development base of QBR Reports is Report Object Structures (ROS). ROS contain the pre-joined tables of data that the user can select his report fields from. The ROS are created in the Object Structure application, and stored in the database. Since formatting of the Ad Hoc reports is left up to the individual user, the ROS only need to be focused on joining related tables. This saves significant development, administration and maintenance time. Then, when a user wants to create his own report, he inputs his requirements, and any number of different reports can be generated based on the application's single report object structure.

QBR - Creation/Execution Process

This document will begin by detailing how a user can Create and Execute Ad Hoc reports. This is the portion of the functionality that the largest number of users will access, and is highlighted in the circled portion of the diagram below.

The document will then conclude with details on the setup work involved in enabling Ad Hoc reports, including administration and how to enable Report Object Structures. This last portion is intended only for developers and/or administrators.

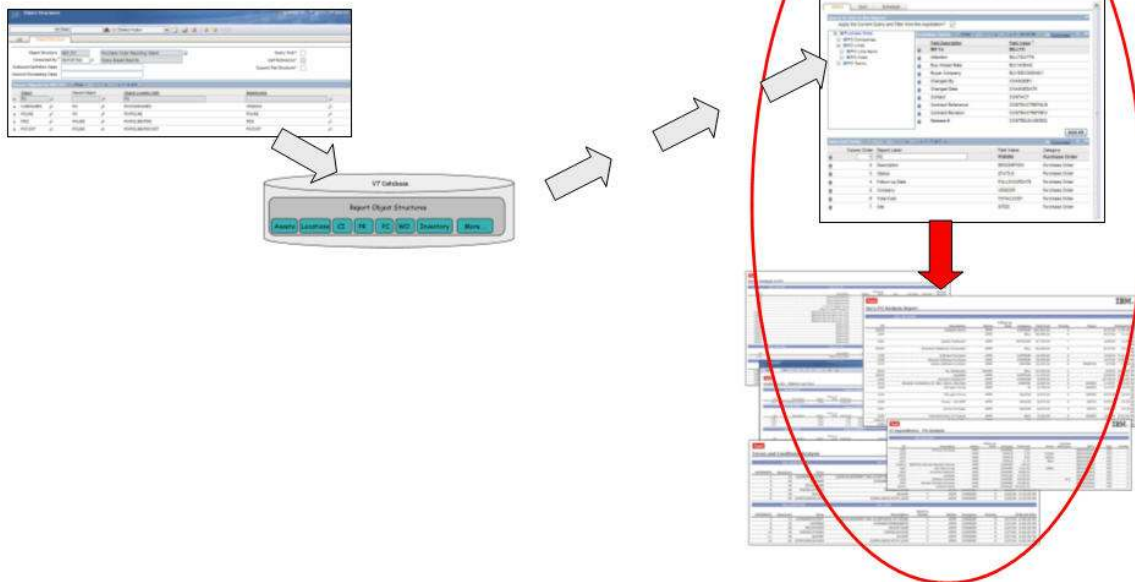
Ad Hoc (QBR) Report

Development

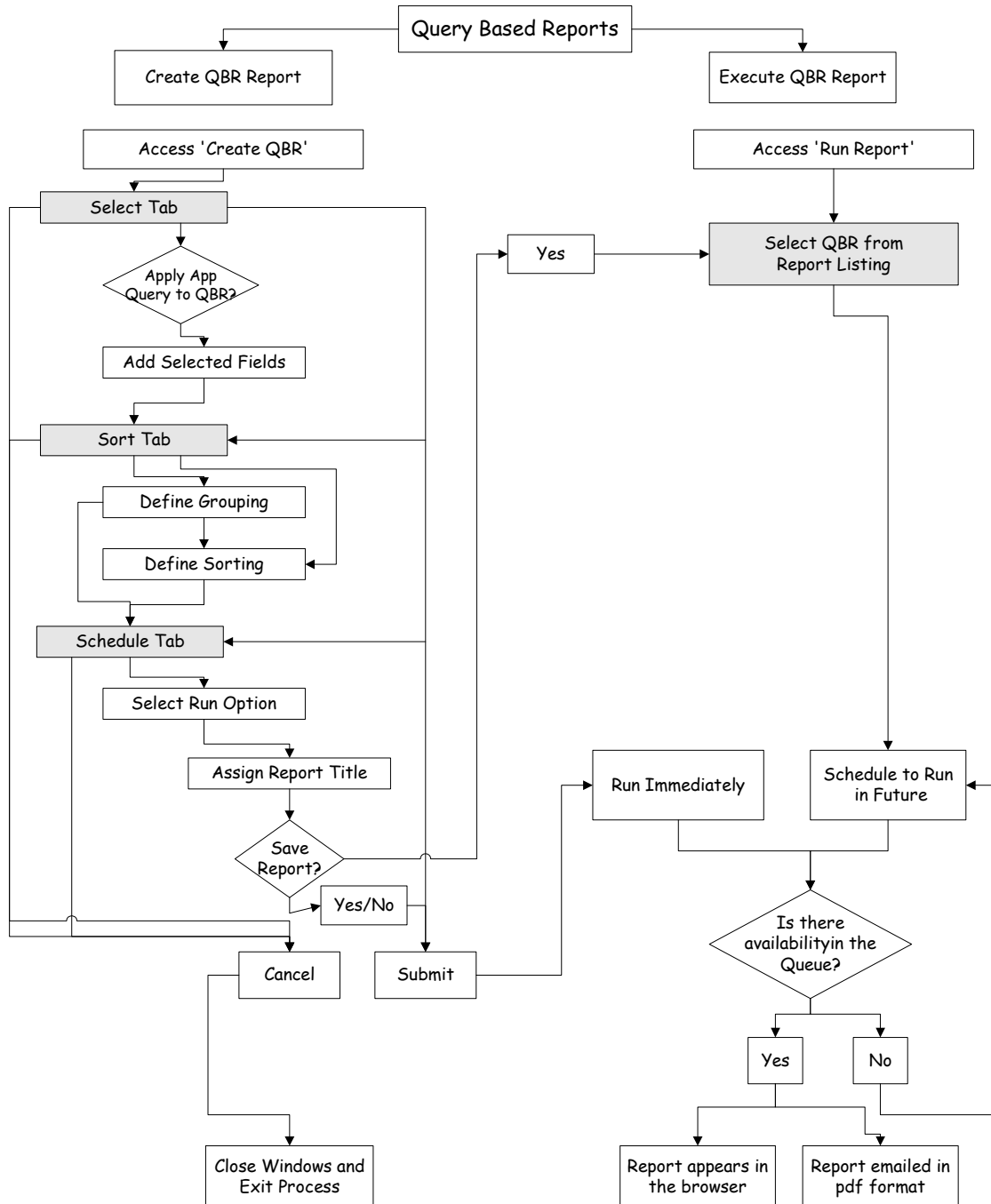
Obj Structure App

Administration

V7 Report Admin



Before QBR reports can be executed, they must first be created. They can be created by business users, and require no knowledge of the database or complex report development tools. Once the QBR reports are created, they are accessed and executed like standard enterprise reports. The flow chart below illustrates the functionality that will be detailed in creating and then executing the QBR reports.



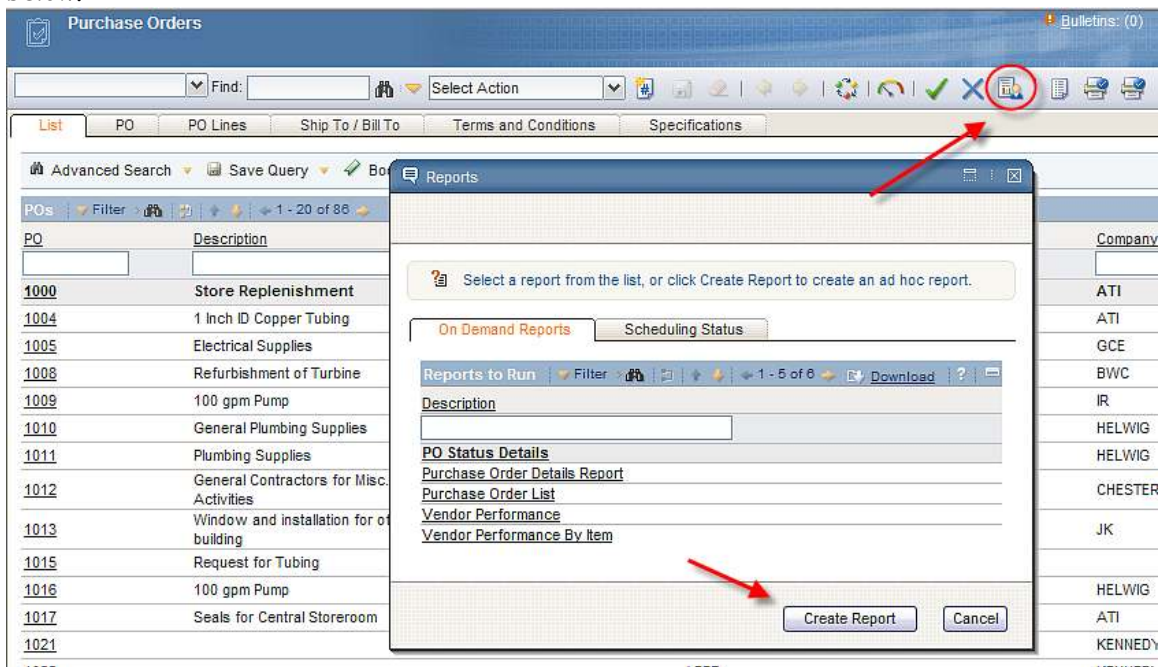
Create QBR: Access

As noted above, QBR reports must first be created before they can be executed. QBR reports can be created by an individual user for his unique business need, or by a supervisor or manager, who wants to create reports to share with a number of different individuals. The individual who creates the QBR report is identified as the owner of the QBR. These next pages detail the steps involved in creating an Ad Hoc report.

To access the Create QBR functionality, users can go to two different places within an application.

- (1) Person icon in the toolbar menu or
- (2) Create Report Button in the bottom section of the Reports Window. The Reports Window is accessed from the application's Action Menu.

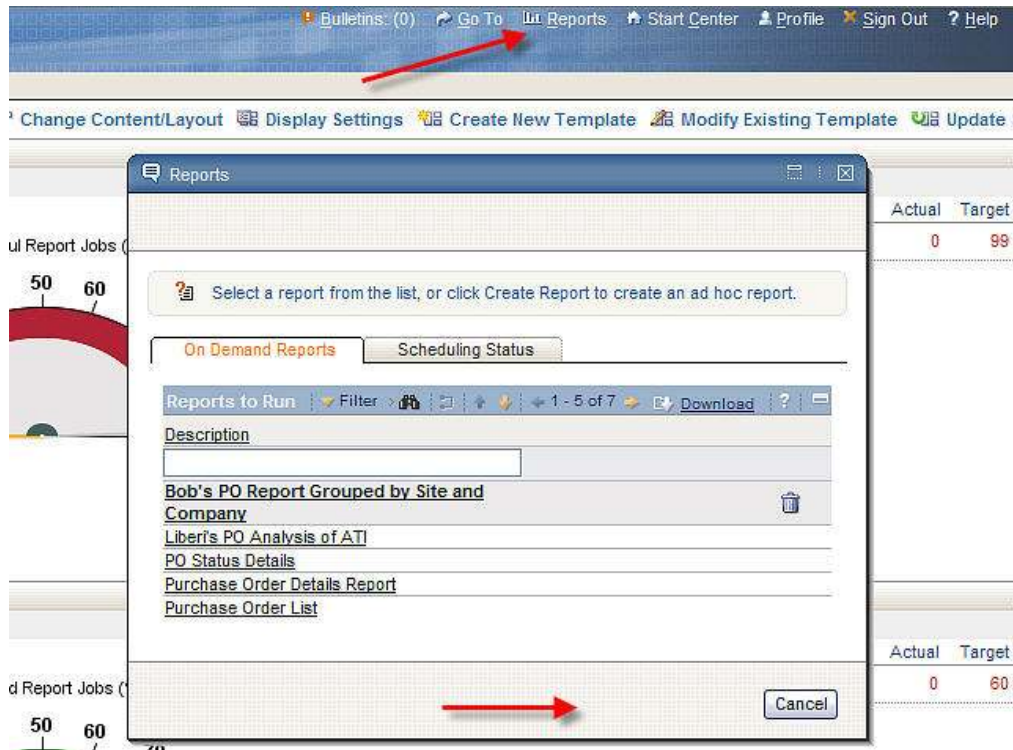
These two locations are highlighted using the Purchase Order application as an example below.






Notes on Accessing QBR Functionality:

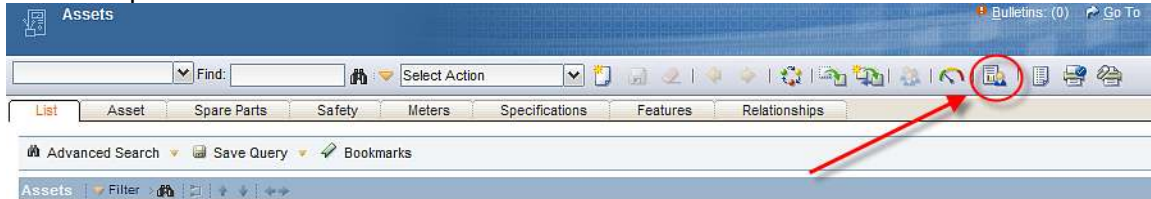
1. The ability to Create New QBRs is only available from within an Application. It is not available from the Report Menu. This is because this functionality is dependant on displaying application values.

- Therefore, if a user accesses reports via the Report Menu in the top right hand corner, the Ad Hoc Report Functionality (Create Report Button) will not be available on that Report Window.
- This is shown below with a screen shot from the Start Center. Because the Start Center is not an application, if the user clicks on Reports from the top Menu, the Create Report Functionality is not available.
- Likewise, if a User was in the Asset application, and from the top Report Menu, selected Reports > Work Orders, the Create Report in the Report Menu for Work Order would not be available. It would only be available for Asset - the application the user is currently in.

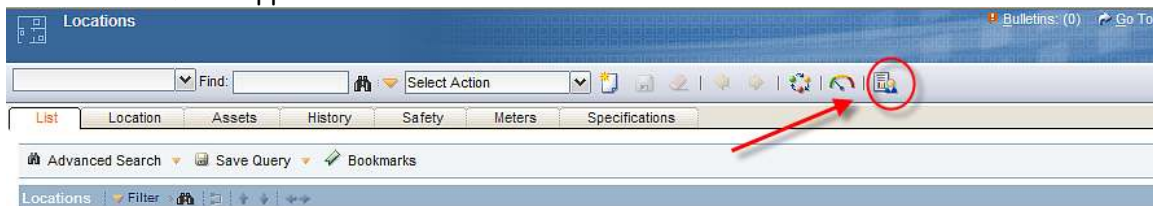


2. The Create Report Icon  will vary in its exact location on the application's toolbar - depending on the application it is accessed from via the business rules below.

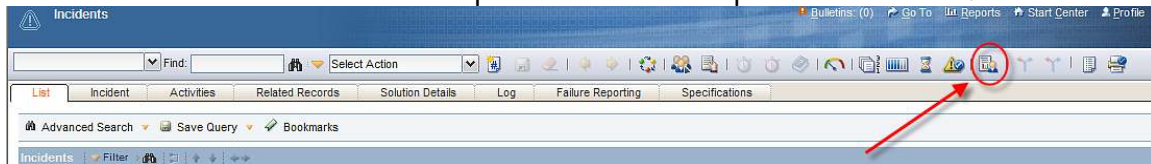
A. If an application has individual report icons configured (ex. Direct Print  or Browser View ) the Create Report Button will be located BEFORE the individual report icons.



B. If no Report Icons are configured, the 'Create Report' Icon will display as the last of the application tool bar icons.



C. However, if an application has Workflow Options enabled, the workflow icons will reside between the Create Report Icon and the Report Toolbar Icons.



3. The Create Report Icon is available on any of the tabs within the applications.

Create QBR: Select Tab

When the user clicks on the Create Button, a new window displays. This is the window the user will utilize to create his unique report, and is often referred to as the QBR Wizard or QBR Window. The QBR Window contains three subtabs - Select, Sort and Schedule - opens to the first tab, Select.

The select tab consists of three sections, which are

1. Query to Use in the Report
2. Available Fields Section, Including Drill Down Tree
3. Selected Fields Section

Query Based Report

Select | Sort | Schedule

To apply the query and filter from the current application to your report, select the Apply the Current Query and Filter check box. The query is saved to the report, and the report uses this saved query every time that you run the report.

Select the fields you want to include in your report by using the arrow icons. To see all of the categories and fields that are available, expand the drilldown on the left. You can select only one category that contains a multiple relationship to the main object.

Query to Use in the Report

Apply the Current Query and Filter from the Application? ☒ 1

Available Fields | Filter | 1 - 10 of 39 | Download

Field Description	Field Value
Bill To	BILLTO
Attention	BILLTOATTN
Buy Ahead Rate	BUYAHEAD
Buyer Company	BUYERCOMPANY
Changed By	CHANGEBY
Changed Date	CHANGEDATE
Contact	CONTACT
Contract Reference	CONTRACTREFNUM
Contract Revision	CONTRACTREFREV
Release #	CONTRELEASESEQ

Selected Fields | Filter | 1 - 7 of 7 | Download

Column Order	Report Label	Field Value	Category
1	PO	PONUM	Purchase Order
2	Description	DESCRIPTION	Purchase Order
3	Status	STATUS	Purchase Order
4	Follow-up Date	FOLLOWUPDATE	Purchase Order
5	Company	VENDOR	Purchase Order
6	Total Cost	TOTALCOST	Purchase Order
7	Site	SITEID	Purchase Order

Submit **Cancel**

Select Tab: Query to use in the Report Section

In the first section of the Select Tab, a checkbox is displayed.

Query to Use in the Report

Apply the Current Query and Filter from the Application? ☒

This checkbox enables the user the option to apply their existing query and filters from an application or not.

- If the user enables the checkbox, the application's current query and filter will be saved to the report. Whenever the report executes, it will always execute with that applied query. This is the default value.
- If the user does not enable the checkbox, the application's current query and filter will *Not* be saved to the report.

This functionality is described below with an example of enabling the Query Flag in the PO Application.

A. Bob goes to the PO application, and opens to his **saved query named BEDFORD_PO**. The BEDFORD_PO query has a where clause of *...where (siteid like '%BEDFORD%')*

B. Bob then applies a **filter of appr in the status field** on the PO list tab. His application's sql where clause is updated to

....where (BEDFORD_PO Query) + (Application Filter)

Which is also described as

((siteid like '%BEDFORD%')) and ((status like '%APPR%'))

C. Bob creates a QBR report and wants it to ALWAYS execute against both the saved query + filter. To do this, he

1. Enables the 'Apply the Current Query and Filter from the Application'.
2. Saves his report to something he will quickly recognize as 'Bedford APPR POs'.

When the report is saved, the application's current where clause (**query + filter**) is saved in the sql of the report design as shown below.

((siteid like '%BEDFORD%')) and ((status like '%APPR%'))

Whenever Bob executes his 'Bedford APPR POs' Report in the future, it will ALWAYS apply the saved where clause *((siteid like '%BEDFORD%')) and ((status like '%APPR%'))* to the report's results.

Next, a scenario where the Query Flag is NOT enabled is described.

A. Bob is in the PO application, and opens to his **saved query BEDFORD_PO**. He applies the same **filter of appr in the status field**.

B. Bob creates a new QBR report, but does **NOT** want it to ALWAYS execute against the combination of his current **query + filter**. Instead, he wants the report to dynamically pick up the active query and filter from the application at the time he executes the report. Therefore, he....

1. Does NOT Enable the 'Apply the Current Query and Filter from the Application'
2. Saves the report as 'Bob's PO Report'.

When the report is saved, the application's current where clause (query + filter) is **NOT** saved in the sql of the report design. Instead, only Bob's Field Selection is saved, along with any database joins, sorting and grouping he selected.

C. Two days later, Bob goes back to the PO application. He opens up to one of his saved application's **queries of POCLOSE**, which has a where clause of...

.....where status = 'CLOSE'

D. Bob filters on 'BOB' in the buyer field on the list tab and his sql where clause becomes

.....where (status like '%CLOSE%') and (purchaseagent like '%BOB%')

E. Bob then wants to run his 'Bob's PO Report' against this current record set. So, he executes the report, and since the 'Save Application's Current Query' Flag WAS not enabled (applied) to the saved report, the report accepts the current, dynamic filter from the application which is

.....where (status like '%CLOSE%') and (purchaseagent like '%BOB%')

The report does NOT use the where clause from the application at the time the report was saved 2 days previously which was...

.....where wostatus = 'APPR' and wopriority = '1'

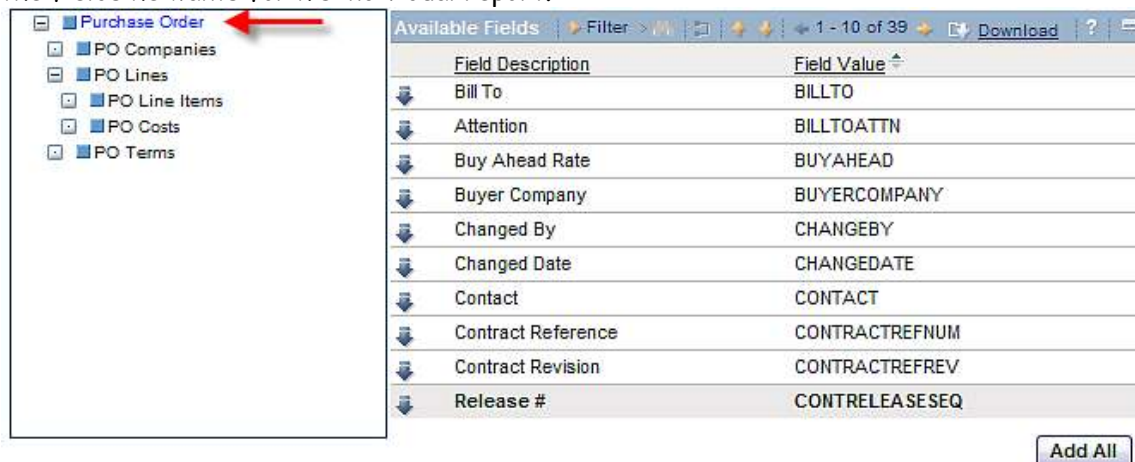
Each of these options supports multiple use cases, so it will be up to the user creating each individual QBR if he wants to apply the Application Current Query and Filter - or not.

Select Tab: Available Fields Section

The second section of the Select Tab is the Available Fields section. On the right side, the available fields a user can add to his report display. On the left, a category tree drilldown displays. Categories are groupings of fields that are related via max relationships. These categories are configurable, and will vary significantly by application.

Categories enable the user to select fields for his report from multiple tables or objects. They are designed to enable the user to visualize the categories and their parent/child relationships. These report categories are defined in the Integration - Object Structure Application as Report Object Structures (ROS). More details on creating these are contained at the end of this document.

Continuing with our example, the Parent Category is Purchase Order. This parent has multiple children (PO Companies, PO Lines and PO Terms), and 1 set of grandchildren under PO Lines (PO Line Items, PO Costs). The user can scroll through these categories to add the fields he wants for his individual report.



When the user clicks on the parent level category, it expands to show all of its children. If a child does not have any children, no further drilldowns will be available. If a child has additional children, parent's grandchildren, they will visually display with the + icon. This is standard Maximo-based Drilldown display. Multiple children-grandchildren relationships can be configured.

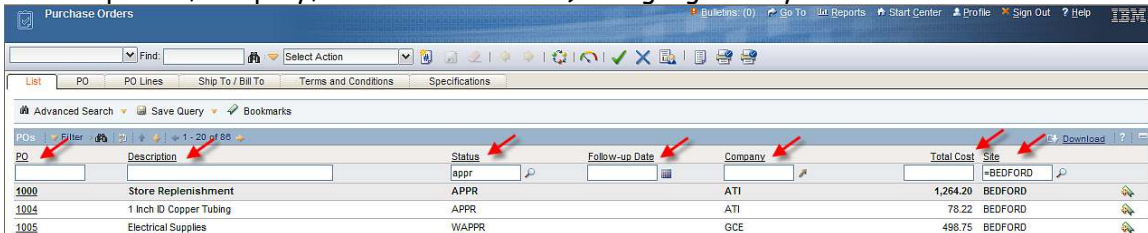
The user can add fields to his report by using the arrow icon next to each field. Additionally, he can 'Add All' or 'Deselect All' of the Fields at once to add or remove fields in mass.

Standard filtering capability is enabled on (1) Field Description or (2) Field Value to help the user quickly find his values. Also note that the 'Available Fields' and 'Selected Fields' Section scroll independently of each other. For example, if the user is scrolling through the Selected Fields Section, the Available Fields Section will stay as is.

Select Tab: Selected Fields Section

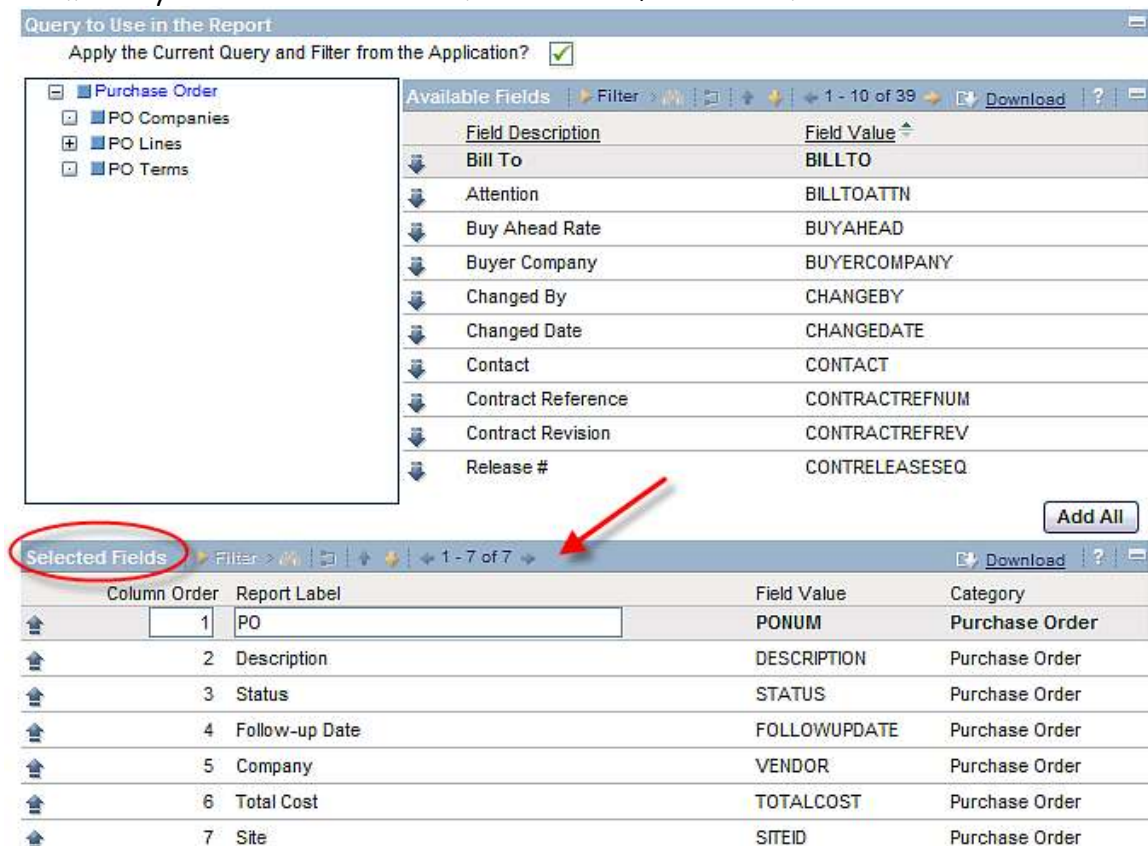
To save the user time and clicks, all of the persistent fields from the Application's List Page display in the Selected Field section by default. Because these fields are the most-heavily used fields in an application, this will save the user time from having to add these fields each time he wants to create a report.

In the PO Application, there are 7 persistent fields on the list tab (PO, Description, Status, Follow-up Date, Company, Total Cost and Site) as highlighted by the red arrows.



PO	Description	Status	Follow-up Date	Company	Total Cost	Site
1000	Store Replenishment	APPR		ATI	1,264.20	BEDFORD
1004	1 inch ID Copper Tubing	APPR		ATI	78.22	BEDFORD
1005	Electrical Supplies	WAPPR		GCE	498.75	BEDFORD

When the user opens up the Query Window, each of these persistent fields has been automatically added to the Selected Field Section for the user.



Field Description	Field Value
BILL TO	BILLTO
Attention	BILLTOATTN
Buy Ahead Rate	BUYAHEAD
Buyer Company	BUYERCOMPANY
Changed By	CHANGEBY
Changed Date	CHANGEDATE
Contact	CONTACT
Contract Reference	CONTRACTREFNUM
Contract Revision	CONTRACTREFREV
Release #	CONRELEASESEQ

Column Order	Report Label	Field Value	Category
1	PO	PONUM	Purchase Order
2	Description	DESCRIPTION	Purchase Order
3	Status	STATUS	Purchase Order
4	Follow-up Date	FOLLOWUPDATE	Purchase Order
5	Company	VENDOR	Purchase Order
6	Total Cost	TOTALCOST	Purchase Order
7	Site	SITEID	Purchase Order

The user is able to quickly navigate through the Available Fields Section, to see what fields are available to add to his report. He can navigate through the Drilldown Category on the left, and select any children or grandchildren categories. When selecting a new category, the Available Fields window will refresh with the fields from the new category. Additionally, the highlighted category will be visualized by a blue text color in the drilldown window.

Field Description	Field Value
Asset	ASSETNUM
Catalog #	CATALOGCODE
Category	CATEGORY
Charge to Store	CHARGESTORE
Class Structure	CLASSSTRUCTUREID
Commodity Code	COMMODITY
Commodity Group	COMMODITYGROUP
Condition Code	CONDITIONCODE
Contract Reference	CONTRACTREFNUM
Contract Reference Revision	CONTRACTREFREV

Additionally, the user can filter for result. When the results display, the user can add individual fields by using the down arrows next to the Field Description, or use the 'Add All' Button to add all of the fields from his Filtered Query to the Selected Field section below.

In this example, the user filtered on 'line' and then adds the PO Line Number field to the Selected Fields. This action causes the followings

- A. Adds the new field(s) to the end of the Selected Field List.
- B. Displays the field's category on the right of the Selected Field section
- C. Removes the selected field from the Available Field Section.

The screenshot shows the 'Available Fields' section on the left and the 'Selected Fields' section on the right. The 'Available Fields' section has a search filter 'line' and lists fields: 'Contract Reference Line ID' (CONTREFLINEID), 'Line Cost' (LINECOST), 'Line Type' (LINETYPE), 'Requisition Line' (MRLINENUM), and 'Received Line Cost' (RECEIVEDTOTALCOST). The 'Selected Fields' section shows a table with columns: Column, Report Label, Field Value, and Category. The 'Category' column is circled in red. The table lists fields: 'PO' (PONUM), 'Description' (DESCRIPTION), 'Status' (STATUS), 'Follow-up Date' (FOLLOWUPDATE), 'Company' (VENDOR), 'Total Cost' (TOTALCOST), 'Site' (SITEID), and 'Line' (POLINENUM). The 'Line' field is highlighted with a red arrow.

Note: When adding fields to the Selected Field Category, the user must follow the hierarchical structure of the ROS. This means that the user has to follow the relationships of selecting fields from the parent, the child and then the grandchild. A user can not add fields from the parent category and then the grandchild - as there is no direct relationship between the parent and the grandchild. If he tries to do this, the error below will display:

The screenshot shows the 'Available Fields' section on the left and the 'Selected Fields' section on the right. The 'Available Fields' section has a search filter 'item' and lists fields: 'Item' (ITEMNUM), 'Item Set' (ITEMSETID), and 'Item Type' (ITEMTYPE). The 'Selected Fields' section shows a table with columns: Field Value and Category. The 'Category' column is circled in red. The table lists fields: 'PO' (PONUM), 'Description' (DESCRIPTION), 'Status' (STATUS), 'Follow-up Date' (FOLLOWUPDATE), 'Company' (VENDOR), 'Total Cost' (TOTALCOST), and 'Site' (SITEID). An error message dialog box is displayed in the foreground with the text: 'BMXAA7031I - Before you select fields from a category, you must select at least one field from its parent category.' The 'Line' field is highlighted with a red arrow.

Note 2: This same logic applies if the user is going to remove fields from the Selected Field Section. Using the example above, if fields are added to the Selected Field Section from the

PO Parent

PO Lines Child

PO Line Items Grandchild

The user can *not* remove fields from the PO Lines Child and only leave fields from PO Parent and PO Line Items Grandchild.

PO Parent

~~PO Lines Child~~

PO Line Items Grandchild

Deleting the parent from the report causes an error because there is no direct relationship between the PO Parent and the PO Line Items Grandchild. At least one field from the PO Lines Child must be maintained in the report to build the table relationships correctly.

The user can continue to add more fields to his QBR Report until he has the complete listing he needs. In this example, Item Number from PO Line Items and Line Cost from the PO Costs Categories were added.

Selected Fields			
Filter > 1 - 10 of 10			
Download ?			
Column Order	Report Label	Field Value	Category
1	PO	PONUM	Purchase Order
2	Description	DESCRIPTION	Purchase Order
3	Status	STATUS	Purchase Order
4	Follow-up Date	FOLLOWUPDATE	Purchase Order
5	Company	VENDOR	Purchase Order
6	Total Cost	TOTALCOST	Purchase Order
7	Site	SITEID	Purchase Order
8	Line	POLINENUM	PO Lines
9	Item Number	ITEMNUM	PO Line Items
10	Line Cost	LINECOST	PO Costs

Refresh Remove All

Additionally, the user can change the Column Order and/or Report Label. To do this, the user types in the new value directly in the applicable text box. After changes are made, the user must click refresh in order for any column order changes to take effect. The order that the columns are displayed after the refresh will always be in ascending order of the Column Order field.

An example of why a user may want to change the Report Label is when fields from different categories have the same Field Value. (For example, Description exists in both PO and PO Line). The user creating the report may want to distinguish these 2 fields by overriding the two Default Description Values with something like PO Description and/or PO Line Description.

Create QBR: Sort Tab

Once the user has all the fields he wants in his Ad Hoc report, he goes to the second tab, Sort, shown below. The Sort tab was introduced in Version 7.1.1.4.

Select **Sort** Schedule

? You can define two levels of grouping in your report. You define groups by fields to combine the report data into similar categories, which help you quickly evaluate the data.
You can also sort the report data in ascending or descending order.

Grouping

	Category	Report Label	Ascending?
Group First By:			<input checked="" type="checkbox"/>
And Then By:			<input checked="" type="checkbox"/>

Remove All

Sorting

	Category	Report Label	Ascending?
Sort First By:			<input checked="" type="checkbox"/>
And Then By:			<input checked="" type="checkbox"/>

Remove All

Report Title

Save Report? ☐
Close Window? ☐

The sort tab is optional. There is no requirement that this functionality be used in a QBR report. Additionally, there are no requirements that both Grouping and Sorting must be done together.

- The user can choose to Group his report only, or Sort his report only.
- If the user chooses both Grouping and Sorting, either function can be defined first. For example, Grouping does not have to be defined before Sorting.

To enable the sorting and grouping functionality however, the user must first have added columns to his QBR Report in the Select Tab. If the user tries to sort and group before adding any fields in the Select Tab, no fields will be available to him to choose from.

Sort Tab: Grouping

This first section in the Sort Tab is Grouping. Within this section, the user is able to select two Groupings. Both are optional and are defined as Null by Default. To enable a grouping, the user has to select a field via the Report Label Lookup. Values can not be directly typed in.

Because of the potential for a large number of available fields to choose from, a dynamic lookup is used on the Grouping and Sorting Category Fields. This lookup only displays the fields that the user identified as 'Selected Fields' in the 'Select' Tab.

The screenshot shows the 'Sort' tab in a software interface. The 'Grouping' section has two rows for 'Group First By' and 'And Then By'. Each row has a 'Category' field and a 'Report Label' field. The 'Report Label' field in the first row is highlighted with a red circle, and a red arrow points to it from the 'Select Value' dialog box. To the right of the 'Report Label' field is a magnifying glass icon and a checkbox labeled 'Ascending?'. Below the 'Grouping' section is the 'Sorting' section, which has similar fields and checkboxes. A 'Remove All' button is located to the right of the 'Ascending?' checkboxes. A 'Select Value' dialog box is open in the center, displaying a table of available fields. The table has three columns: 'Category', 'Report Label', and 'Field Value'. The table lists various fields related to 'Purchase Order', 'PO Lines', 'PO Line Items', and 'PO Costs'. A red arrow points from the 'Select Value' dialog box to the 'Report Label' field in the 'Grouping' section.

Category	Report Label	Field Value
Purchase Order	PO	PONUM
Purchase Order	Description	DESCRIPTION
Purchase Order	Status	STATUS
Purchase Order	Follow-up Date	FOLLOWUPDATE
Purchase Order	Company	VENDOR
Purchase Order	Total Cost	TOTALCOST
Purchase Order	Site	SITEID
PO Lines	Line	POLINENUM
PO Line Items	Item Number	ITEMNUM
PO Costs	Line Cost	LINECOST

Notes:

1. Multi-select option is not available on the lookup as it is not known if the field is for the first grouping or second.
2. This lookup is derived dynamically for each QBR. Additionally, the fields in the lookup are non-persistent, so the lookup and values are not sort-able or filter-able.

Two fields can be enabled for grouping.

The first grouping must be defined before the second. To enable this, the second grouping field is disabled until the first grouping is applied.

After the grouping selection(s) is made, the user can choose to have the grouped fields display in ascending or descending order. The default is to have the flag enabled, so the results are grouped in ascending order. The screen shot below shows the first grouping to be by Site in ascending order, and a second grouping by Company in descending order.

Query Based Report

Select Sort Schedule

You can define two levels of grouping in your report. You define groups by fields to combine the report data into similar categories, which help you quickly evaluate the data.

You can also sort the report data in ascending or descending order.

Grouping

	Category	Report Label	
Group First By:	Purchase Order	Site	Ascending? <input checked="" type="checkbox"/>
And Then By:	Purchase Order	Company	Ascending? <input type="checkbox"/>

Remove All

Sorting

	Category	Report Label	
Sort First By:			Ascending? <input checked="" type="checkbox"/>
And Then By:			Ascending? <input checked="" type="checkbox"/>

Remove All

Report Title

Save Report? ☐

Close Window? ☐

Sort Tab: Sorting

The second section in the Sorting Tab is Sorting. Sorting will follow the same process as grouping, meaning that the fields to be sorted will be selected off the lookup. If two fields need to be sorted, the user will access the lookup twice.

The Report Label lookup that is used in the Sorting and Grouping Section is the same.

The first sorting must be defined before the second. To enable this, the second sorting will be disabled until the first grouping is enabled.

Users can add the same field in the Sorting Section that is in the Grouping Section. If the user specifies a different sort order than the grouping order specifies, the grouping order will take precedence.

In the example below, after the grouping was defined, the user selected to sort the data by PO Number in ascending order.

The screenshot shows the 'Query Based Report' window with the 'Sort' tab selected. The interface includes a 'Select' tab, a 'Sort' tab (highlighted in orange), and a 'Schedule' tab. A help message states: 'You can define two levels of grouping in your report. You define groups by fields to combine the report data into similar categories, which help you quickly evaluate the data. You can also sort the report data in ascending or descending order.'

The 'Grouping' section is active, showing two levels of grouping. The first level is 'Group First By: Purchase Order' and 'And Then By: Purchase Order'. The second level is 'Report Label: Site' and 'Company'. Both are set to 'Ascending?' with a checked checkbox. A 'Remove All' button is present.

The 'Sorting' section is also active, showing 'Sort First By: Purchase Order' and 'And Then By:'. The 'Report Label' is 'PO'. Both are set to 'Ascending?' with a checked checkbox. A 'Remove All' button is present.

At the bottom, there is a 'Report Title' field and two checkboxes: 'Save Report?' and 'Close Window?'.

Sort Tab: Miscellaneous Grouping and Sorting Notes:

1. Grouping of report data is an extremely valuable concept which enables the user to view data quickly and concisely in multiple categories. However, certain data types lend themselves more to groupings than others. For example, data fields with time values may be very difficult to group on due to the wide variation in time values.
 - a. However, we do not want to limit the data types that users group on, therefore no limitations have been placed on the data types that can be grouped.
2. Only two grouping and two sorting sections are enabled out of the box. This was determined after analyzing the numbers of groupings and sorting over 300 Maximo Reports, along with balancing the client input in minimizing the complexity of the QBR Functionality. If this does not meet the individual needs of a client, they can modify the code for a larger set of groupings is required.
3. The sort order from an application is not applied to the QBR report. If the user wants to apply the same sort order that was enabled in the application, he must explicitly specify it on the SORT tab within the QBR window.

Common Fields - All Three Tabs

Before reviewing the Schedule tab, it is important to review the bottom fields that are displayed on all three Tabs. At the very bottom of each tab are two buttons: Cancel and Submit. At any time during the QBR Creation Process, the user can select either of these buttons.

CANCEL: Cancels cancel the report creation process and close the QBR Window.

SUBMIT: Takes the report inputs and passes them to the report engine. The report will be generated and displayed to the user in HTML.

Directly above the Cancel and Submit button are the Report Title and Save fields. These fields are optional and can be used if a user wants to save the QBR Report for execution in the future. These three fields include:

Report Title: The Report Title that appears at the top of the report. It is also the text displayed to the user when he clicks 'Run Reports'. It is typically a value that is meaningful to the user, and enables him to quickly identify the report in the future.

- By default, this value is null.
- It is identified in the database as REPORT.DESCRPTION.
- If the user enables the Save Report? Field, the Report Title is required.

Save Report? This field enables the user to save his unique report inputs as a report design file. Often a user may need to execute his unique report on a regular basis, or may want to share it with others. In these cases, the user should save his report. Saving the report creates multiple database table entries including:

1. REPORT, for report details including the userid of the person creating the QBR
2. REPORTDESIGN for the created XML Report Design File
3. REPORTLABEL with the Report File Name and Column Descriptions
4. REPORTDEPEND for the Maximo System Libraries

In other cases however, a user may only need a report for a single instance, or he may still be in processing of determining the best content for the report. In these two use cases, the user will choose to not Save their report.

Close Window?: The 'Close Window?' field enables the user to close all report dialogs after executing his report.

- If the user chooses to enable the 'Close Window?' field, after the report executes in the browser, the user will return to V7 and all reporting windows will be closed.
- If the user chooses to NOT enable the 'Close Window?' field after the report executes in the browser, the user will return to V7 and the QBR Window and report window will still be open.

The default for 'Close Window' is


Enabled if the User Saves his Report

Not-Enabled if the User does not Save his Report

Create QBR: Schedule Tab

The last tab in the QBR Window is the Schedule Tab. It contains scheduling and emailing options. These fields behave the same way as the Scheduling/Emailing Options on an Enterprise Report's Request Page. The immediate Run Option is displayed by default.

Select	Sort	Schedule
--------	------	----------

 To run your report immediately, click Submit. To schedule a report to run at a specific time, select the At this Time option and specify a time. To schedule the report to run on a recurring basis, select the Recurring option and specify an interval.

You can add a title for your report that appears on the report. Click Save Report to run your report in the future. Your report will appear in the Report Window Listing.

Schedule

☒ Immediate

☐ At this Time

☐ Recurring

E-mail

To

Subject

Comments

Report Title

Save Report? ☐

Close Window? ☐

Schedule Tab: Run Report Immediately

Continuing with our example, the user names his report 'Bob's PO Report Grouped by Site and Company', and saves the report.

Query Based Report

Select Sort **Schedule**

To run your report immediately, click Submit. To schedule a report to run at a specific time, select the At this Time option and specify a time. To schedule the report to run on a recurring basis, select the Recurring option and specify an interval.

You can add a title for your report that appears on the report. Click Save Report to run your report in the future. Your report will appear in the Report Window Listing.

Schedule

☒ Immediate
☐ At this Time
☐ Recurring

E-mail

To
Subject
Comments

Report Title * Bob's PO Report Grouped by Site and Company

Save Report? ☒
Close Window? ☒

He chooses to run the report immediately and the report queue is checked to see if there is availability. If there is availability, the report will execute immediately and display in the report browser.

Reporting

Page 1 of 1

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Bob's PO Report Grouped by Site and Company

Site: BEDFORD		Company: SWKING					
PO	Description	Status	Follow-up Date	Total Cost	Line	Item	Line Cost
1077	Adobe Software Contract	APPR		12,300.00	1	ACROBAT 8	12,300.00

Site: BEDFORD		Company: OFFRUS					
PO	Description	Status	Follow-up Date	Total Cost	Line	Item	Line Cost
1024		APPR		5.00	1	584-LO	5.00
1026		APPR		2.50	1	231177	0.00
1026		APPR		2.50	2	231177	0.00
1026		APPR		2.50	3	230-00	2.50
1027		APPR		11.70	1	0-0514	11.70

Site: BEDFORD		Company: KENNEDY					
PO	Description	Status	Follow-up Date	Total Cost	Line	Item	Line Cost
1021		APPR		0.00	1	560-00	0.00
1022		APPR		6.19	2	0-0031	2.50
1022		APPR		6.19	1	900610	3.69
1023		APPR		0.00	1	584-LO	0.00

Site: BEDFORD		Company: JK					
PO	Description	Status	Follow-up Date	Total Cost	Line	Item	Line Cost
1013	Window and installation for office building	WAPPR		499.20	1	1002	0.00
1013	Window and installation for office building	WAPPR		499.20	2		480.00
1029	Window and installation for Office Building	APPR		499.20	1	1002	0.00
1029	Window and installation for Office Building	APPR		499.20	2		480.00

Site: BEDFORD		Company: IR	
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Note: For more information on Report Queuing, reference the V7 Report Feature Guide.

When the report is displayed in the browser, standard reporting functionality is available. This includes converting to pdf for saving or printing, downloading to csv or navigating through the pages of results. If the report is converted to pdf, it displays as follows:

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IBM®

Bob's PO Report Grouped by Site and Company

Site: BEDFORD			Company: SWKING					
PO	Description	Status	Follow-up Date	Total Cost	Line	Item	Line Cost	
1077	Adobe Software Contract	APPR		12,300.00	1	ACROBAT_8	12,300.00	
Site: BEDFORD			Company: OFFRUS					
PO	Description	Status	Follow-up Date	Total Cost	Line	Item	Line Cost	
1024		APPR		5.00	1	584-L0	5.00	
1026		APPR		2.50	1	231177	0.00	
1026		APPR		2.50	2	231177	0.00	
1026		APPR		2.50	3	230-00	2.50	
1027		APPR		11.70	1	0-0514	11.70	
Site: BEDFORD			Company: KENNEDY					
PO	Description	Status	Follow-up Date	Total Cost	Line	Item	Line Cost	
1021		APPR		0.00	1	560-00	0.00	
1022		APPR		6.19	2	0-0031	2.50	
1022		APPR		6.19	1	900810	3.69	
1023		APPR		0.00	1	584-L0	0.00	
Site: BEDFORD			Company: JK					
PO	Description	Status	Follow-up Date	Total Cost	Line	Item	Line Cost	
1013	Window and installation for office building	WAPPR		499.20	1	1002	0.00	
1013	Window and installation for office building	WAPPR		499.20	2		480.00	
1029	Window and installation for Office building	APPR		499.20	1	1002	0.00	
1029	Window and installation for Office building	APPR		499.20	2		480.00	
Site: BEDFORD			Company: IR					
PO	Description	Status	Follow-up Date	Total Cost	Line	Item	Line Cost	
1009	100 gpm Pump	APPR		6,784.00	1	PUMP100	6,400.00	

January 7, 2009 6:35:48 AM EST

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January 7, 2009 6:35:48 AM EST

1 / 5

If the report is downloaded to csv, it displays as shown below. Please note that the grouping format is not transferred to csv.

File Edit View Insert Format Tools Data Window Help										
Comic Sans MS 10 B I U										
Snagit Window										
A1	ponum									
	A	B	C	D	E	F	G	H	I	J
1	ponum	description	status	followup	date	totalcost	siteid	polinum	itemnum	linecost
2	1077	Adobe Soft	APPR		SWKING	12300	BEDFORD		1 ACROBAT_	12300
3	1024		APPR		OFFRUS	5	BEDFORD		1 584-L0	5
4	1026		APPR		OFFRUS	2.5	BEDFORD		1 231177	0
5	1026		APPR		OFFRUS	2.5	BEDFORD		2 231177	0
6	1026		APPR		OFFRUS	2.5	BEDFORD		3 230-00	2.5
7	1027		APPR		OFFRUS	11.7	BEDFORD		1 0-0514	11.7
8	1021		APPR		KENNEDY	0	BEDFORD		1 560-00	0
9	1022		APPR		KENNEDY	6.19	BEDFORD		2 0-0031	2.5
10	1022		APPR		KENNEDY	6.19	BEDFORD		1 900810	3.69
11	1023		APPR		KENNEDY	0	BEDFORD		1 584-L0	0
12	1013	Window an	WAPPR		JK	499.2	BEDFORD		1 1002	0
13	1013	Window an	WAPPR		JK	499.2	BEDFORD		2	480
14	1029	Window an	APPR		JK	499.2	BEDFORD		1 1002	0
15	1029	Window an	APPR		JK	499.2	BEDFORD		2	480
16	1009	100 gpm Pu	APPR		IR	6784	BEDFORD		1 PUMP100	6400
17	1010	General Plu	APPR		HELWIG	332.07	BEDFORD		3 0-7205	5
18	1010	General Plu	APPR		HELWIG	332.07	BEDFORD		1 0-0048	298
19	1010	General Plu	APPR		HELWIG	332.07	BEDFORD		2 900810	7.58
20	1011	Plumbing S	APPR		HELWIG	108.55	BEDFORD		2 570-72	75
21	1011	Plumbing S	APPR		HELWIG	108.55	BEDFORD		1 6-L203	26.53
22	1016	100 gpm Pu	APPR		HELWIG	6572	BEDFORD		1 PUMP100	6200

QBR Report Display Notes:

1. When a QBR Report is created, the user's individual report inputs are taken and converted to a .rptdesign file via an API. This 'on-the-fly' report design file utilizes the V7 Standard Formatting, including the standard colors, fonts, logos and page formatting. This information is applied to the report design file via the Maximo System Library.
2. If a QBR Report is converted to pdf, it will display in landscape format, like the other Enterprise V7 Out of the Box reports.
3. As noted earlier, there are no limitations to the number of fields a user can add to the report. A user can choose to only include a single data field, or a very large number like 50 fields.

If the user adds a very large number of database fields to their QBR report, this will require the user to scroll through the Report Browser to view all of their fields.

Additionally, if the user prints or exports the report with a very large number of fields to Adobe, all of the report fields will not display due to the fixed page size of Adobe.

Also, if the user prints the report to HTML, the user will need to scroll through the Report Browser to view all of their fields - but only a portion of those fields will print in HTML due to the fixed page size.

However, these constraints should not limit users to a minimum number of fields because many users want a large number of fields to export to .csv or .xls for additional data analysis. Since the export of data to .csv/.xls is a primary requirement of this functionality, the number of fields the user can utilize in his QBR Report will not be limited by scrolling or incomplete display of data in pdf.

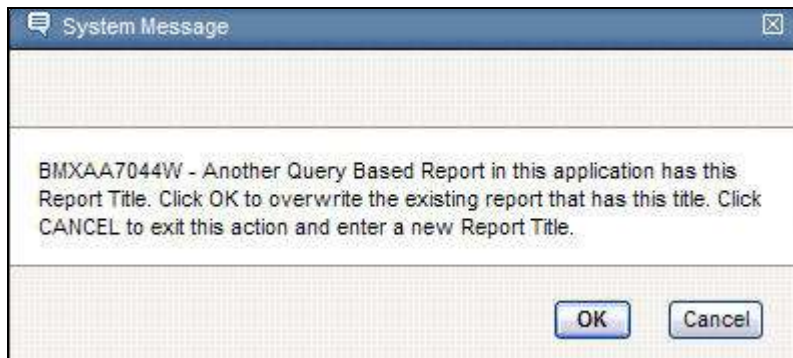
QBR: Miscellaneous Report Title and Saving Notes:

1. A user can create multiple QBR Reports with the same title, as long as they are created from different applications. He can not create multiple QBR Reports with the same name in the same application.

For example, user Bob creates a QBR Report with the title 'Bob's Report' in the Asset application. He can create a different QBR Report and save it with the same report title 'Bob's Report' as long as it is created from a different application.

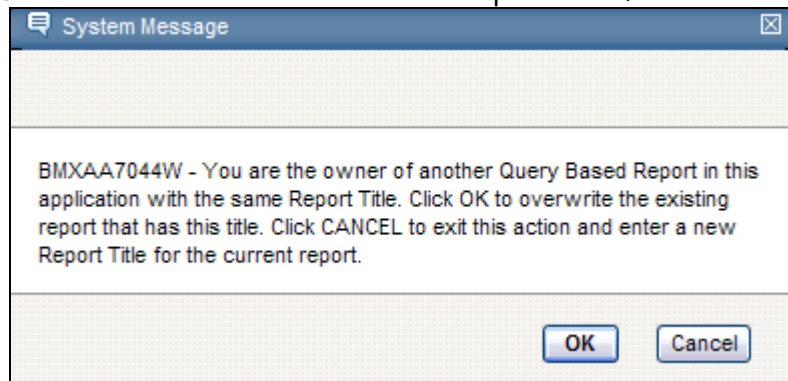
If the user tries to create multiple QBR reports with the same title in the same application, he will receive the error message below.

BMXAA7044W - Another Query Based Report in this application has this Report title. Click OK to overwrite the existing report that has this title. Click CANCEL to exit this action and enter a new Report Title.



June 2009 - This error message above was updated in the Base Services 7.1.1.5 Release for additional clarification. The updated message is shown here

BMXAA7044W - You are the owner of another Query Based Report in this application with the same Report Title. Click OK to overwrite the existing report that has this title. Click CANCEL to exit this action and enter a new Report Title for the current report.



2. QBR Report Titles must be also be unique with any other BIRT Reports within the Application. This applies to any BIRT report - whether it is a BIRT QBR report or a BIRT Enterprise report.

For example, a client has an Enterprise Report called 'Vendor Analysis' in the Purchasing application. If a user then tries to create a Ad Hoc report with the Report Title of 'Vendor Analysis' in the Purchasing application, they will receive the error below.

BMXAA7045E - Another report in this application has this Report Title. Specify a new Report Title.



QBR Report Execution

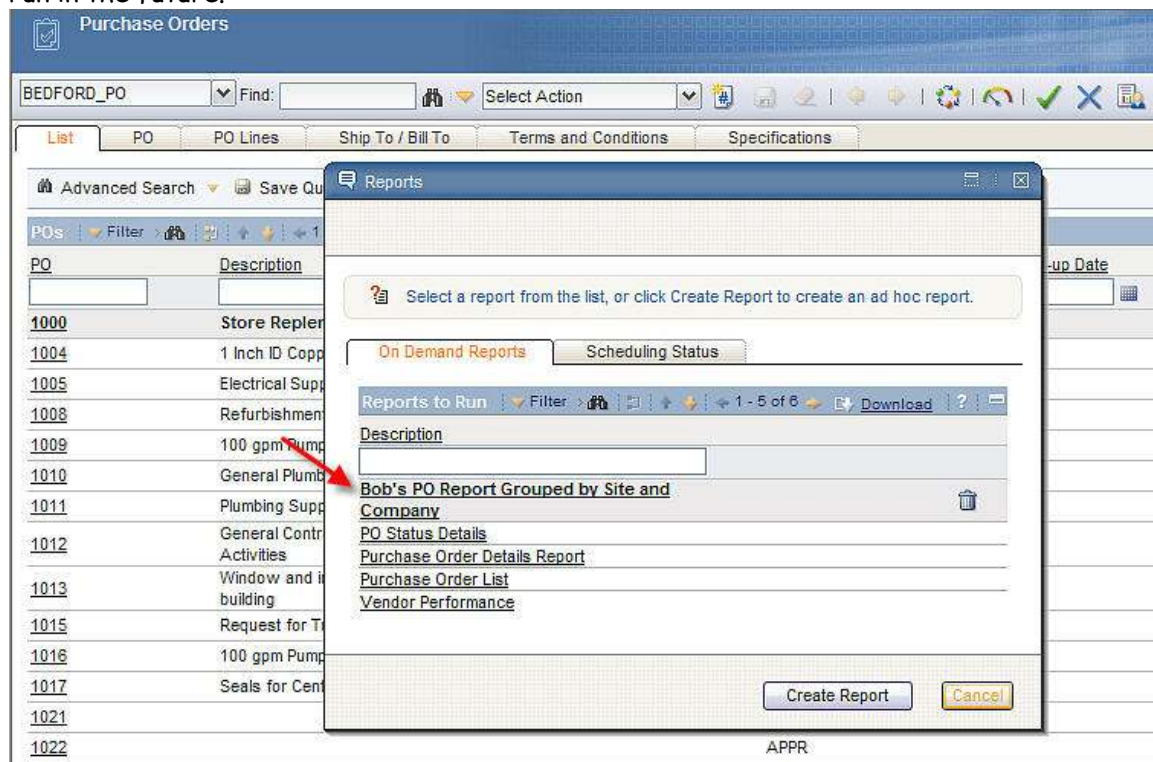
After the report is created, it can be executed immediately or scheduled to execute in the future. If the QBR Report is saved, a number of different actions can occur including:

- Executing from the Run Report Window
- Enabling other security groups to access
- Deleting the QBR when it is no longer required

Executing from the Run Report Window

After the user creates and saves a QBR Report, it is accessible to him from the Reports window. This is shown below as the new QBR Report 'Bob's PO Report Grouped by Site and Company' is displayed.

The user can then click on that report, and either execute it immediately or schedule it to run in the future.

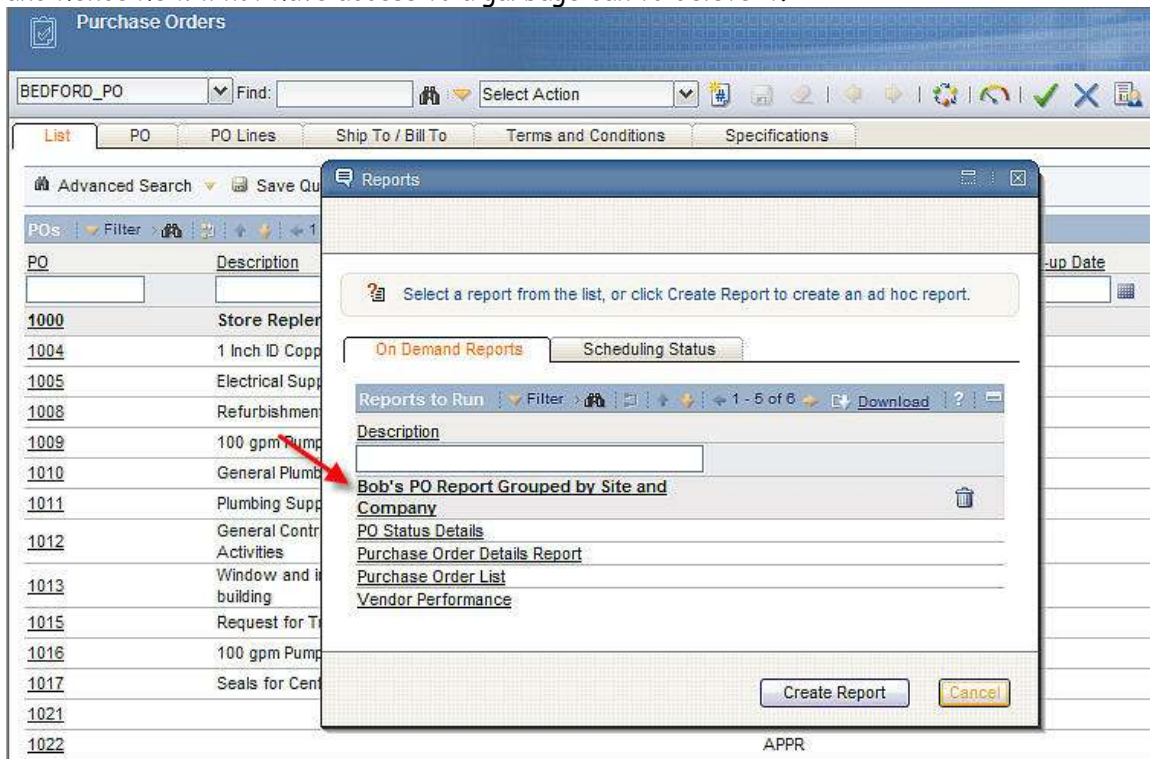


Deletion of the QBR when it is no longer required

QBR Reports can be deleted when they are no longer required. This may occur when a user decides that he no longer needs a certain QBR Report. To delete a QBR, the user accesses the Report list. A garbage can displays for any QBR that the user can delete. The user can only delete QBR Reports that he is the owner of. These are identified by his userid matching REPORT.USERID.

If the user clicks on the garbage can, the icon will show it has been selected for deletion, and standard Maximo deletion functionality applies.

If a user has access to a QBR that was not created by him, he does not have the ability to delete it, and hence he will not have access to a garbage can to delete it.



Additionally, an administrator can delete QBR reports when a user may move on to another position. Administrators can delete QBR reports in the Report Administration application through the standard 'Delete Report' Functionality available from the Action Menu.

Additionally, note that Security access to delete QBRs is enabled via the EVERYONE group. By default, all apps that have 'Create Report' functionality will have the 'Delete Report Button' enabled for the EVERYONE Group. This is shown in the screenshot below.

The screenshot displays the 'Security Groups' application interface. The 'Applications' tab is selected, showing a list of applications. The 'Group' dropdown is set to 'EVERYONE'. The 'Delete Report Button' is highlighted with a red arrow, and its 'Grant Access?' checkbox is checked and circled in red.

Description	Main Object/Table
asset	
Asset Link Results	Asset Link Result view.
Asset Reconciliation Results	Asset Result of Link and/or Comparison
Assets	The ASSET Table

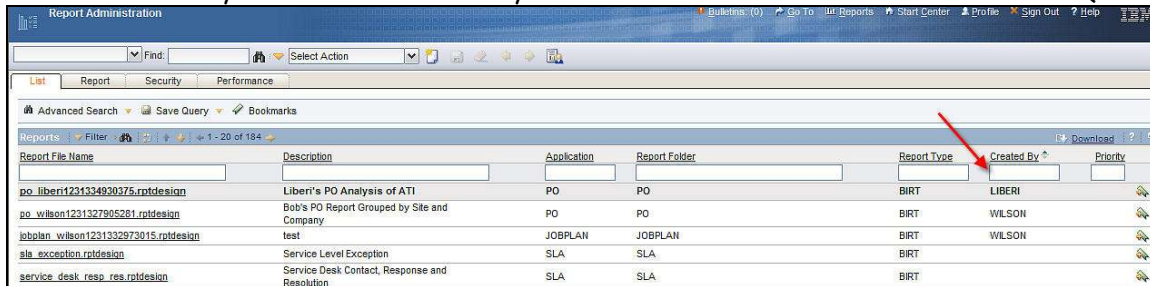
Description	Grant Access?
Create Report Button	<input type="checkbox"/>
Delete Report Button	<input checked="" type="checkbox"/>
Report Downtime	<input type="checkbox"/>
Run Reports	<input type="checkbox"/>

Enabling Access for Other Security Groups

Only the user creating the individual QBR report has security access to run and execute the saved QBR report. This is because Ad Hoc reporting is based on an *individual's* business needs, and for many instances, the Ad Hoc report is only accessed by a single individual. This is enabled by including the USERID of the individual who created the report to the report's record when it is saved.

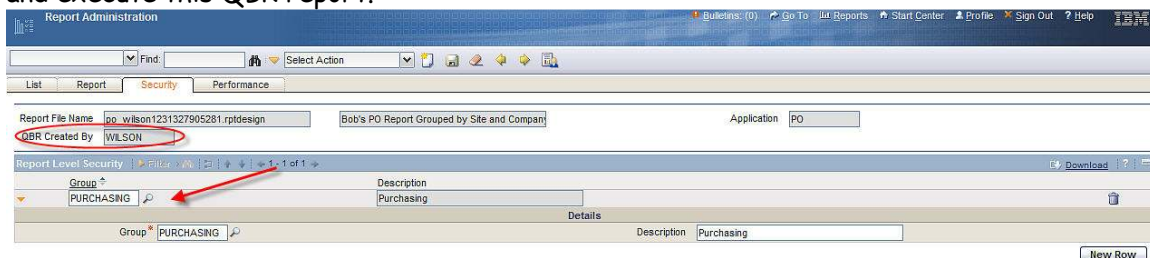
However, others may need access to this report either because the owner wants to share it with others, or if a manager wants to share a report with people he manages. To enable this, Report Security to the QBR is granted by an administrator in Report Administration. Report Application Security Access only applies to Enterprise Reports - not QBR Reports.

To enable this, the administrator accesses Report Administration. He then locates the specific report by either filtering the report results by report title, or by filtering the results on the list tab on the 'Created By' Field. The Created By Field identifies the owner/creator of each QBR.



Report File Name	Description	Application	Report Folder	Report Type	Created By	Priority
po_liberi1231334930375.rptdesign	Liberi's PO Analysis of ATI	PO	PO	BIRT	LIBERI	
po_wilson1231327905281.rptdesign	Bob's PO Report Grouped by Site and Company	PO	PO	BIRT	WILSON	
jobplan_wilson1231332973015.rptdesign	test	JOBPLAN	JOBPLAN	BIRT	WILSON	
sla_exception.rptdesign	Service Level Exception	SLA	SLA	BIRT		
service_desk_resp_res.rptdesign	Service Desk Contact, Response and Resolution	SLA	SLA	BIRT		

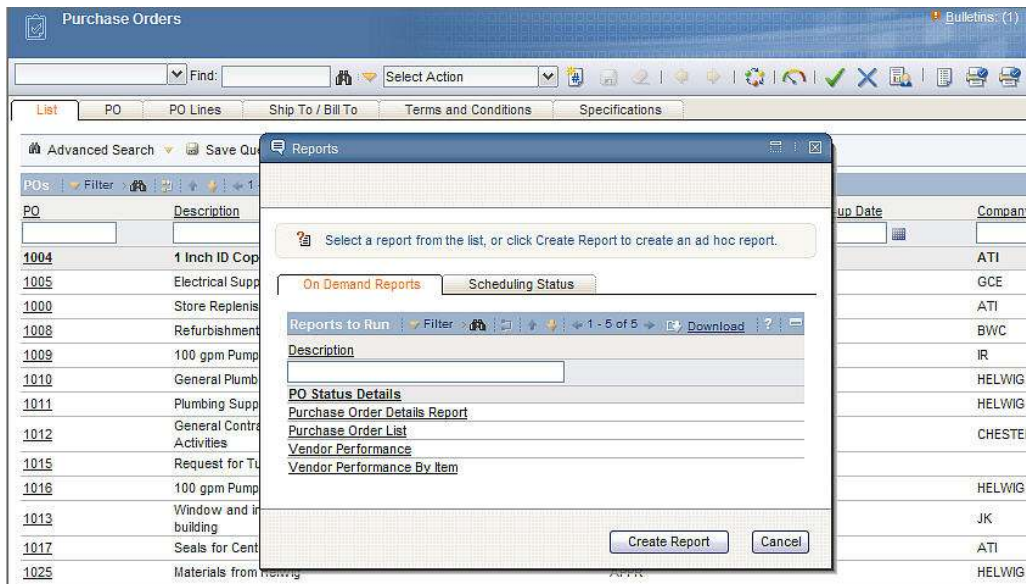
Once he finds the particular QBR Report, he grants Security Groups access to execute the report on the Security Tab. This is illustrated with Bob Wilson's report below, where the Purchasing Group has been granted access to it. With this change, any member of the Purchasing Group will be able to see and execute this QBR report.



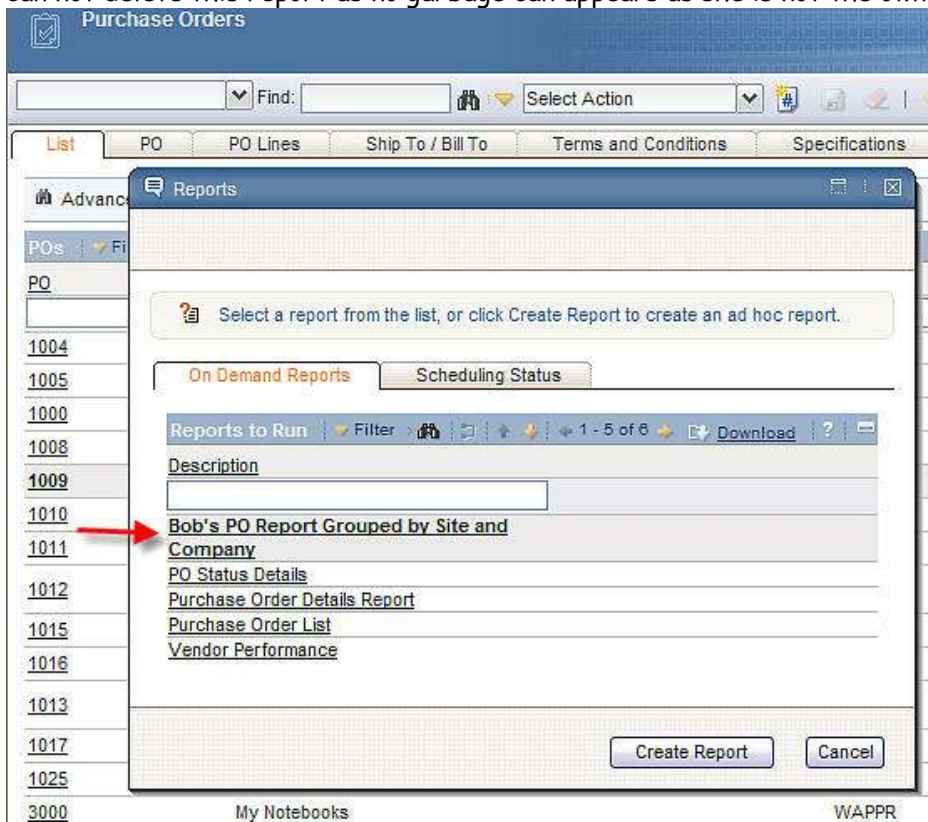
Report File Name	Description	Application
po_wilson1231327905281.rptdesign	Bob's PO Report Grouped by Site and Company	PO

Group	Description
PURCHASING	Purchasing

To illustrate this, user, Liberi, will be used. Liberi is a member of the Purchasing Group and she has access to all Purchasing reports. When she clicks 'Run Reports' from the PO application, she sees the list of reports below. Notice, she does not see Bob's QBR Report because she has not been granted security access to it.



Now, the administrator grants security access to the Purchasing Group to Bob's QBR report which is shown in the Report Administration screen shot on the previous page. The next time Liberi accesses the report window, she will see and be able to execute Bob's QBR Report. Notice however that she can not delete this report as no garbage can appears as she is not the owner of this QBR Report.



If Liberi then creates her own QBR Report, it will display with the others. However, since she is the owner, it will display a Garbage Can which she can use to delete the report in the future.

The screenshot shows the 'Purchase Orders' application interface. A 'Reports' dialog box is open, displaying a list of reports. The report 'Liberi's PO Analysis of ATI' is highlighted, and a red arrow points to its name. A red circle highlights the trash icon next to the report name. The dialog also includes a 'Create Report' button and a 'Cancel' button.

Purchase Orders

Find: [] Select Action []

List PO PO Lines Ship To / Bill To Terms and Conditions Specifications

Advanced Search

POs Filter []

PO []

1004

1005

1000

1008

1009

1010

1011

1012

1015

1016

1013

1017

1025

3000

Reports

Select a report from the list, or click Create Report to create an ad hoc report.

On Demand Reports Scheduling Status

Reports to Run Filter [] 1 - 5 of 7 Download []

Description

Bob's PO Report Grouped by Site and Company

Liberi's PO Analysis of ATI

PO Status Details

Purchase Order Details Report

Purchase Order List

Create Report Cancel

QBR - Security Access

Before detailing how the security functionality is enabled for QBR reports, a best practices overview of security for QBR reports will be detailed.

Best Practices - QBR Security Access

Each of your Version 7 users has a broad range of skills sets and job requirements. Because of this diversity, you should carefully evaluate report security - and which users have access to report execution and creation.

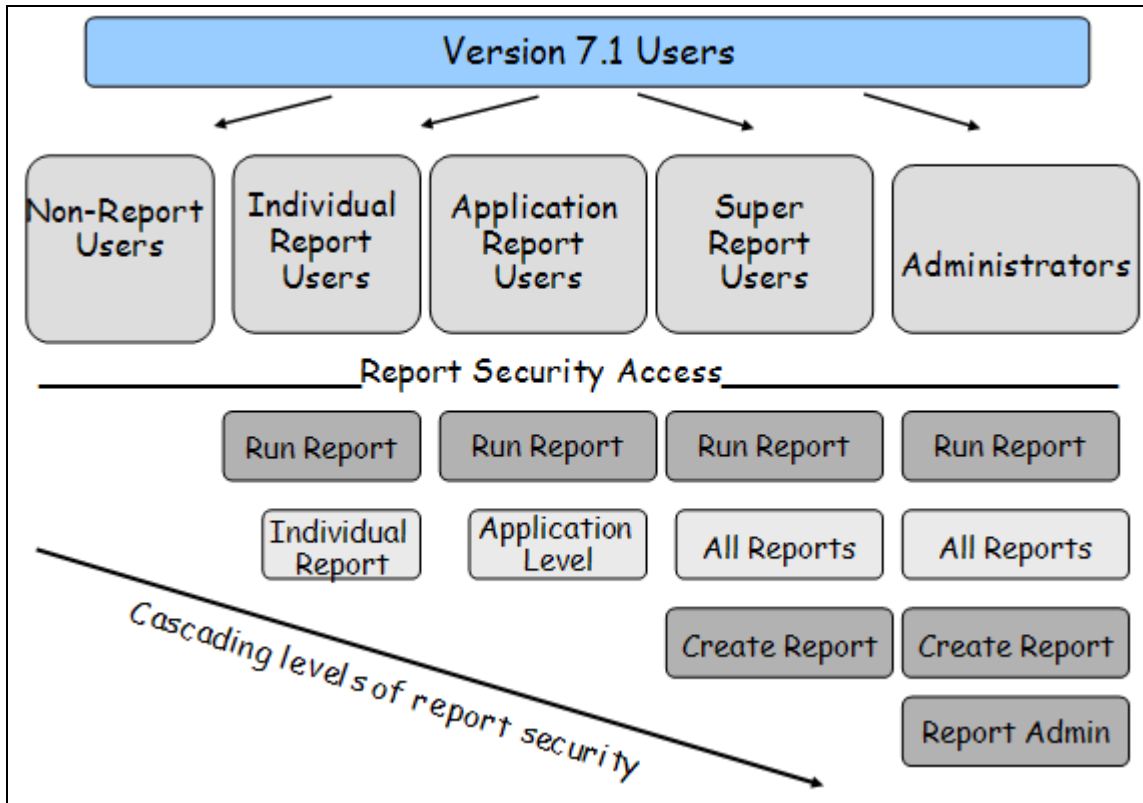
Using your users varying skill sets and job requirements, you can place them into different reporting categories which could include

1. Non Report Users: Users who utilize the system for viewing data, querying or status input only. They either do not require the ability to execute reports for their job, or they require a very structured functionality process, which does not include report execution.
2. Individual Report Users: Users with specific job requirements, requiring limited access to a small set of reports.
3. Application Report Users: Users with a broader range of job requirements, and who work extensively in a specific set of Maximo applications.
4. Super Report Users: Users whose primary focus is on analyzing data to improve business processes, or to provide data to supervisors/managers. These users are very familiar with the Maximo database and a variety of software tools.
5. Administrators: Users who administer and maintain all aspects of reporting, including security, repository, usage and performance enablers. This individual has the greatest level of report security.

Each of these groups of users should be granted varying levels of report security. This will insure they have the functionality they need to perform their job, while also making sure they are not performing actions which could potentially negatively impact the system or other users.

For example, the 'Individual Report Users' who has very specific job requirements, and hence limited access to a small number of applications within Maximo - would only require access to a small number of reports. Therefore these users should not be granted 'All Report Security Access'. Instead, they should only be granted security access to run a small, selected number of reports, and should not be granted access to create QBR reports.

This compares to the Super Report User, who has access to a large number of applications within Maximo, is familiar with the Maximo database, and spends a large percentage of his day using a variety of software tools. This user should have access to run all reports, and also create his own reports.



*More details on the varying levels of report security - Individual, Application and All Reports - can be found in the V7 Report Feature guides available here <http://ibm.co/niokIv>

Functionality - QBR Security Access

As noted above, the best practices recommendation is that you restrict the number of users who have Create QBR report access. Create QBR report access should only be given to users trained in the functionality, and those with a top level understanding of the Maximo database structure and applications. Restricting QBR security access will help in preventing all users from creating large numbers of reports that may contain very large record sets and that may not be needed.

Therefore, the ability to 'Create' a QBR report must be explicitly granted from the Security Group application for each application. The security group must first have 'Run Report' Access, and then the additional 'Create' QBR Functionality can be given.

Security groups can have 'Create' QBR access for some applications and not others. This enables you to manage the security groups creating reports. This security restriction can prevent users from creating unnecessary reports, which can consume premium database and application server resources.

The Create QBR functionality is available for any application that has the 'Run Report' Action available. An example of this is the Asset application shown below. In this case, the Security Group 'PLANNING' has security rights to run reports, but not to Create QBR reports.

The screenshot shows the 'Security Groups' application in Maximo. The 'Group' is set to 'SCHEDULING'. The 'Applications' tab is selected, and the 'Assets' application is chosen. The 'Options for Assets' section shows the 'Create Report Button' with a red arrow pointing to it. The 'Grant Access?' checkbox is also highlighted with a red circle.

Description	Main Object/Table
asset	
Asset Link Results	Asset Link Result view.
Asset Reconciliation Results	Asset Result of Link and/or Comparison
Assets	The ASSET Table

Description	Grant Access?
create report, run	<input type="checkbox"/>
Create Report Button	<input type="checkbox"/>
Run Reports	<input checked="" type="checkbox"/>

If an application does not have the 'Run Report' Application available, the Create QBR functionality will not be available. There is a dependency on the Create Report functionality on RUNREPORT. An example of this is the BBOARD (Bulletin Board) application.

These security group authorizations are held in the APPLICATIONAUTH table (select * from APPLICATIONAUTH where optionname = 'CREATEREPT').

For demo/testing purposes, the maxdemo database has enabled the 'Create QBR' functionality for the MAXADMIN Security Group.

Miscellaneous Report Admin Features for QBR Reports

1. Report administrators can extend QBR reports by enabling settings as Schedule Only, Priority and Display Orders. More details on these specific features can be found in the Report Feature Guide.

Report Administration

Find: [] Select Action: []

Report File Name: po_wilson1231327905281.rptdesign Bob's PO Report Grouped by Site and Company Application: PO Report Folder: PO Last Import Date: 1/7/09 8:34 AM

Report Type: BIRT Imported By: WILSON QBR Created By: WILSON

Settings

Limit Records? [] Max Record Limit: [] Schedule Only? [] Priority: [] No Request Page? [] Use Where Clause? [] Display Order: [] Toolbar Sequence: [] Browser View? [] Browser View Location: NONE Direct Print? [] Direct Print Location: NONE Direct Print with Attachments? [] Direct Print with Attachments Location: NONE

Parameters

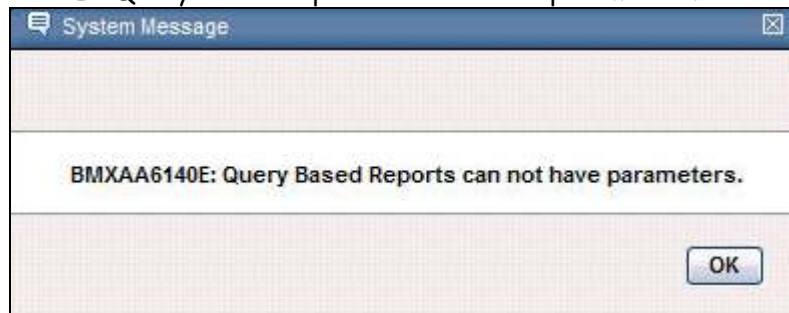
Parameter Name	Attribute Name	Sequence	Display Name	Required?
No rows to display...				

New Row

2. Parameters: QBR reports execute against the Current Record Set of the Application. They do not execute against User Inputted Parameters. Therefore,

- When a user accesses a saved QBR report, no parameters display on its request page. Depending on the filter saved with the QBR, the report will either run against the current record set, or against the query saved with the report.
- Because of this, the functionality to add report parameters for QBRs in the Report Administration application is not enabled. If an administrator tries to add a parameter to a QBR, the following message displays:

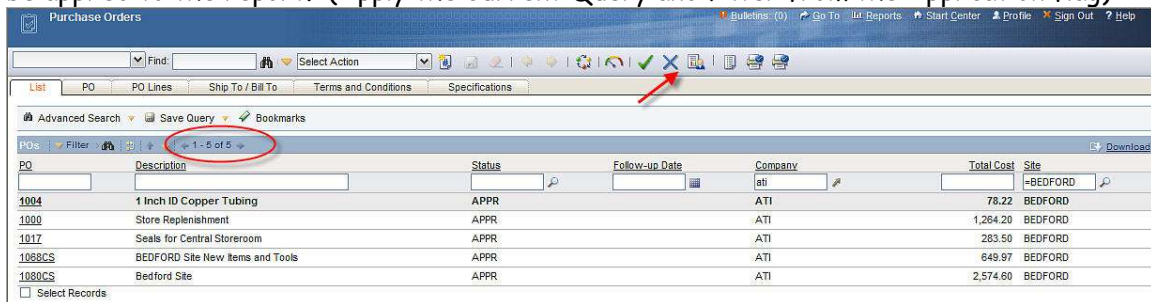
BMXAA6140E: Query Based Reports can not have parameters.



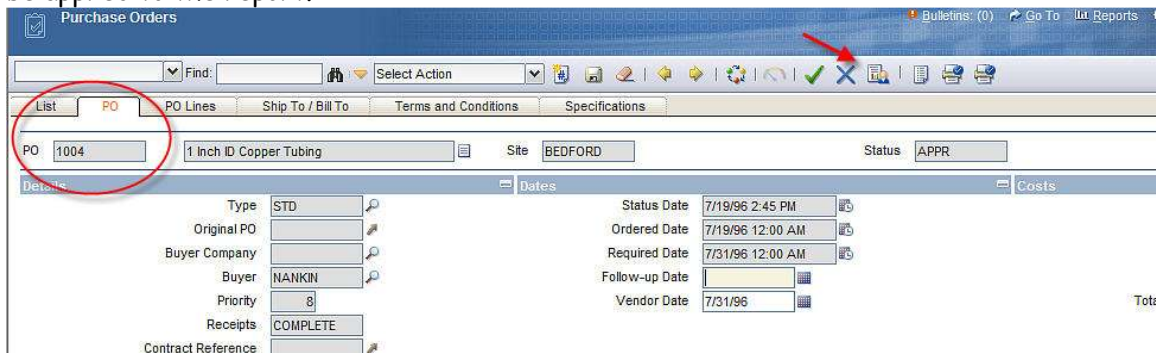
If you need to add parameters to a QBR report, you must first add them to its design file (.rptdesign) within the BIRT Designer. When you make these types of parameter updates, or any other updates which could include adding calculations or graphs, the report is changed from a QBR to an enterprise report.

3. QBR reports execute against the current record set of an application. Therefore if you access the 'Create Report' functionality from either the list tab or detail tab of an application, the report will always use the current record set of the application. It does not limit itself to the selected record set. This may be best explained by an example.

A user is in the PO application, and filters his records to form a result set of 5 records. If he access the 'Create QBR' functionality from the list tab - the current record set of 5 can be applied to the report. (Apply the Current Query and Filter from the Application flag)



Additionally, if the users clicks on the PO Tab for that individual 'selected' record - and then clicks on the 'Create QBR' Functionality - the original current record set of 5 can still be applied to the report.



This is different behavior than an Enterprise report as the business rule is QBR will always utilize the current record set on report creation.

Extending Ad Hoc Reporting Functionality

The features listed below are a few items that clients may wish to utilize to extend or customize the Ad Hoc Reporting functionality.

Importing/Exporting and Report Design File Structure

QBR reports are unique from Enterprise reports in that QBRs do not require an import process to load the report design's file in the database. Instead, when the user creates and saves the QBR, the report design (.rptdesign) is saved to the database. This enables the report design to be extended in the BIRT Designer. This can be an excellent starting point for a report developer creating a custom report - as he then only has to extend the report - not create it from a blank template.

To extend the Ad Hoc Report, the developer would follow the steps below:

Setup Steps: The reporttools.properties file is used to enable both importing and exporting operations. This file is located at: <V7>\reports\birt\tools, and includes the text below

```
# HostName or IP address of the machine that has MAXIMO application running in
an App Server
maximo.report.birt.hostname=localhost

# HTTP port of the application server (the port used to access maximo from
browser)
maximo.report.birt.port=9080

# Indicates whether the SSL communication is enabled or not
maximo.report.birt.ssl=false

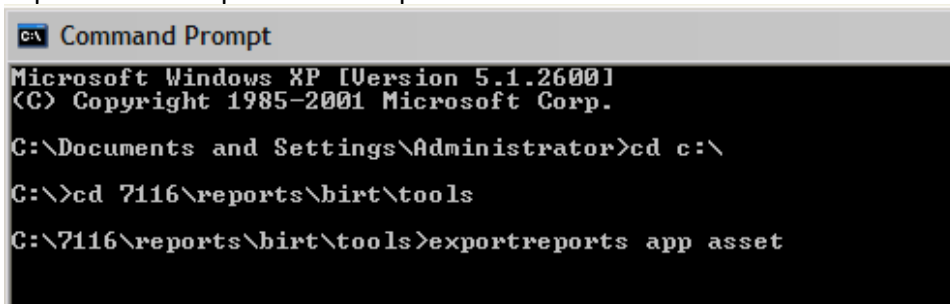
# User that has access to perform the operation
maximo.report.birt.username=wilson

# Password of the user that has access to perform the operation
maximo.report.birt.password=wilson

# Output folder used for the export operation
maximo.report.birt.outputfolder=c:/7116/reports/birt/export/asset
```

The output folder highlighted in red is the file location of the exported Ad Hoc report.

1. To export an Ad Hoc Report, open a command window. Navigate down to the exportcommands path.... <V7>\reports\birt\tools



```
C:\ Command Prompt
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings\Administrator>cd c:\
C:\>cd 7116\reports\birt\tools
C:\7116\reports\birt\tools>exportreports app asset
```

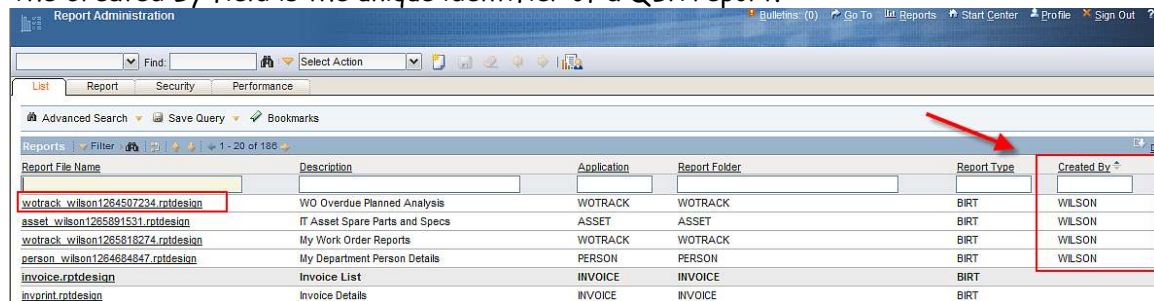
2. Depending on what you want to export, input your command. This example is exporting all reports from the asset application - both enterprise and ad hoc reports using the command:
exportreports app asset

```
[exportreports] Exporting report: [ASSET] assetmove_history.rptdesign
[exportreports] Exporting report: [ASSET] asset_glaccount.rptdesign
[exportreports] Exporting report: [ASSET] asset_po.rptdesign
[exportreports] Exporting report: [ASSET] mgmt_sw.rptdesign
[exportreports] Exporting report: [ASSET] asset_external.rptdesign
[exportreports] Exporting report: [ASSET] asset_wilson1253022976.rptdesign
[exportreports] Exporting report: [ASSET] asset_wilson1253735606.rptdesign
[exportreports] Exporting report: [ASSET] asset_wilson1254250482.rptdesign

BUILD SUCCESSFUL
Total time: 37 seconds

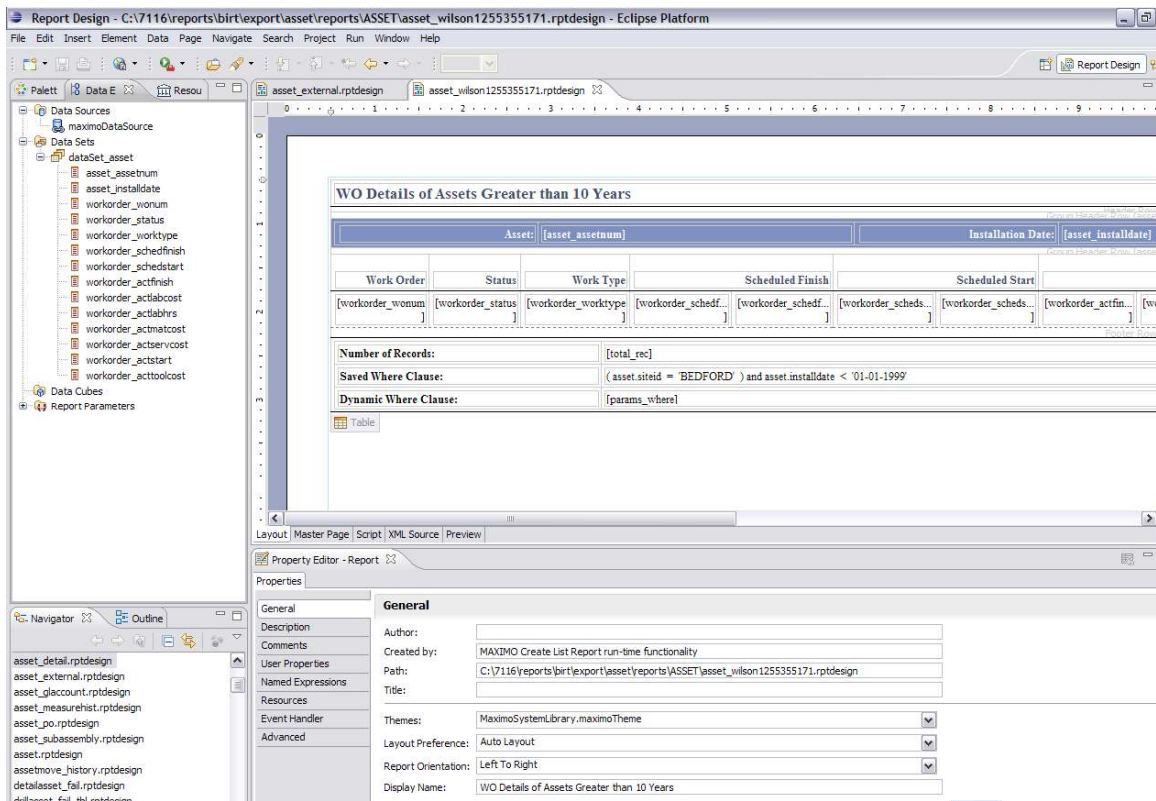
C:\7116\reports\birt\tools>
```

*Note: Export a single report by: exportreports app <reportfilename>
To find out the file name of your Ad Hoc Report, navigate to the Report Administration application. Sort on the 'Created By' Field on the list tab, so the QBR reports display first. The Created By field is the unique identifier of a QBR report.



Report File Name	Description	Application	Report Folder	Report Type	Created By
wotrack_wilson1264507234.rptdesign	WO Overdue Planned Analysis	WOTRACK	WOTRACK	BIRT	WILSON
asset_wilson1265891531.rptdesign	IT Asset Spare Parts and Specs	ASSET	ASSET	BIRT	WILSON
wotrack_wilson1265818274.rptdesign	My Work Order Reports	WOTRACK	WOTRACK	BIRT	WILSON
person_wilson1264684847.rptdesign	My Department Person Details	PERSON	PERSON	BIRT	WILSON
invoice.rptdesign	Invoice List	INVOICE	INVOICE	BIRT	
invprint.rptdesign	Invoice Details	INVOICE	INVOICE	BIRT	

3. Next, navigate to the BIRT Designer. From the menu, click File - Open File and navigate to the directory where you exported your reports. The Ad Hoc Report you created displays



To view its sql, click on the Script Tab highlighted below with the dataset_asset highlighted.



This gives the report developer an excellent starting point for additional extensions if needed - like adding a graph or enabling hyperlinks between reports.

4. If the developer chooses to modify the design file, it is recommended that the report file name be modified to identify it from the original file. If the developer plans on utilizing this report as an Enterprise Report, he would need to create and/or append the reports.xml and properties file for the new enterprise report. Additionally, because it is now an enterprise report, it would need to be imported through the reports import command, or the UI utility in the Report Administration application.

Number of Rows in Select Tab of QBR Window

10 rows display by default in the 'Available Fields' and 'Selected Fields' sections of the Select QBR Tab. This number can be configurable by the client in the library.xml file located in <V7>\resources\presentations\system in the code shown below.

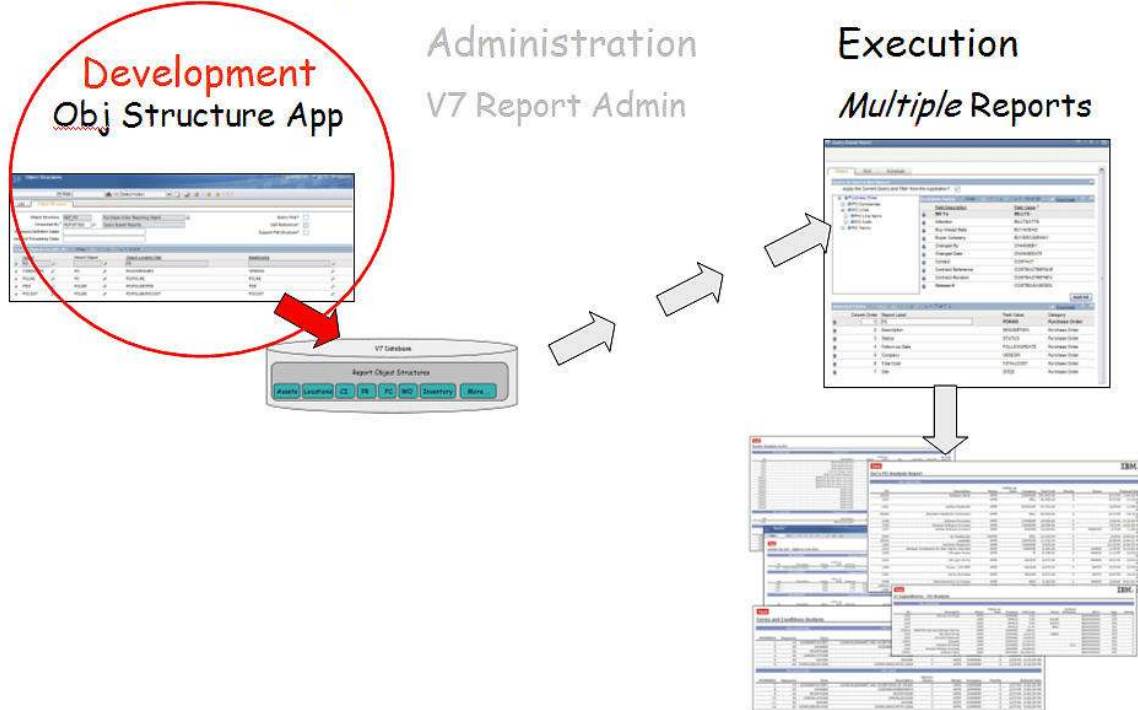
```
<table id="available_fields_table" label="Available Fields" inputmode="readonly" relationship="MAXATTRIBUTE" orderby="attributename"
  <tablebody id="available_fields_table_body" displayrowsperpage="10" filterexpanded="false" filterable="true" >
    <tablecol id="available_fields_table_col_1" type="event" axevent="addattribute" axevent_icon="btn_moveToSelected.gif" axevent_de
    <tablecol id="available_fields_table_col_2" label="Field Description" dataattribute="title" sortable="true" showfilterfield="tru
    <tablecol id="available_fields_table_col_3" label="Field Value" dataattribute="attributename" sortable="true" showfilterfield="t
  </tablebody>
</table>
```

If you want to modify this default value, it should be set in both the 'Available Fields' and 'Selected Fields' Section. The updated xml file should then be reimported via the Application Designer.

QBR - Development Process

Next, the document will details the setup work involved in enabling Ad Hoc Reports, including Administration and how to enable Report Object Structures. This last portion is intended only for developers and/or administrators.

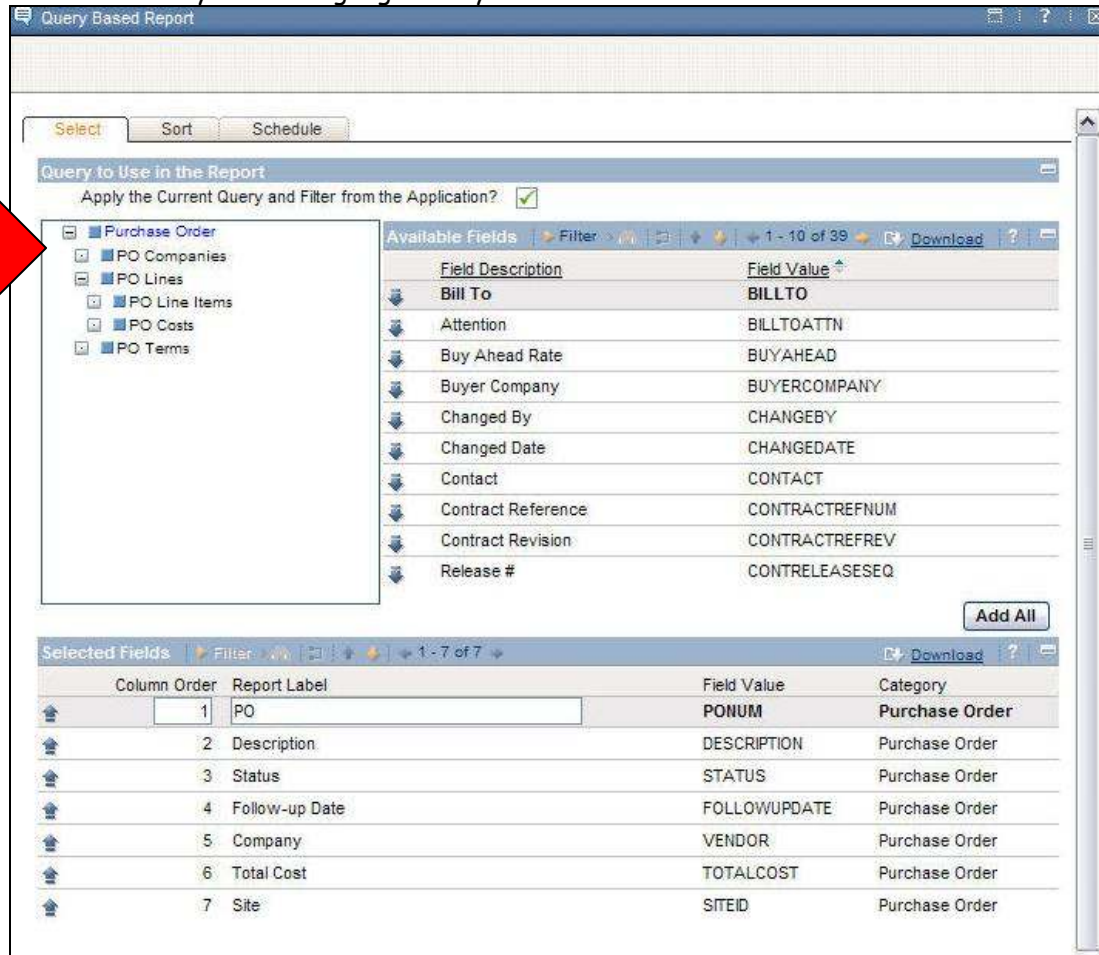
Ad Hoc (QBR) Report



Overview of ROS

Report Object Structures (ROS) are used to enable the QBR functionality. ROS enable users to select fields from multiple categories (objects) for their ad hoc reports. Additionally, ROS are designed to enable users to visualize application categories and their parent/child relationships. These categories are displayed via a category tree drilldown in the Select Tab of the QBR Window in the top left hand side.

The example below shows the default QBR for Purchase Orders. The Drilldown Category Tree enabled by ROS is highlighted by the red arrow.



The screenshot shows the 'Query Based Report' window. On the left, a tree view shows the hierarchy: 'Purchase Order' (parent), 'PO Companies', 'PO Lines', 'PO Line Items', 'PO Costs', and 'PO Terms' (children). A red arrow points to 'Purchase Order'. The 'Available Fields' list includes: Bill To, Attention, Buy Ahead Rate, Buyer Company, Changed By, Changed Date, Contact, Contract Reference, Contract Revision, and Release #. The 'Selected Fields' table is as follows:

Column Order	Report Label	Field Value	Category
1	PO	PONUM	Purchase Order
2	Description	DESCRIPTION	Purchase Order
3	Status	STATUS	Purchase Order
4	Follow-up Date	FOLLOWUPDATE	Purchase Order
5	Company	VENDOR	Purchase Order
6	Total Cost	TOTALCOST	Purchase Order
7	Site	SITEID	Purchase Order

In this example, the Parent Category is Purchase Order. This parent has multiple children (PO Companies, PO Lines and PO Terms), and 1 set of grandchildren under PO Lines (PO Line Items, PO Costs). The children and grandchildren categories are Source Objects created for the Application's Main Object, Purchase Order, through maxrelationships.

If a child does not have any children, no further drilldowns are available. If a child has additional children, (main object's grandchildren), they are displayed visually with the + icon. This is standard Maximo-based Drilldown display. Multiple children-grandchildren relationships can be configured with ROS.

Set up Work for Report Object Structures

To enable field selection from multiple tables, setup or administrative work needs to be done to enable ROS.

It is very important that this setup work be done by a developer or administrator who is very familiar with the Maximo database and database concepts. Without this knowledge, the ROS can be setup incorrectly, leading to bad or misleading data in the QBR reports.

Three steps must occur to create and enable Report Object Structures. These steps are

1. Create Report Object Structures

The first thing that must be enabled is Report Object Structures and their categories must be defined in the Integration - Object Structure Application. An example of the PO ROS is shown in the screen shot below.

The screenshot shows the 'Object Structures' application interface. At the top, there's a navigation bar with 'Bullets: (0)', 'Go To', 'Int Reports', 'Start Center', 'Profile', 'Sign Out', and 'Help'. Below this is a search bar and a 'Select Action' dropdown. The main area is titled 'Object Structure' and shows details for 'REP_PO' (Purchase Order Reporting Object). It includes fields for 'Consumed By' (REPORTING), 'Outbound Definition Class', and 'Inbound Processing Class'. There are also checkboxes for 'Query Only?', 'Self Reference?', 'Support Flat Structure?', 'User Defined?', 'Configurable?' (checked), and 'Alias Conflict?'. Below this is a table of 'Source Objects for REP_PO' with columns: Object, Parent Object, Object Location Path, Relationship, Object Order, and User Defined?.

Object	Parent Object	Object Location Path	Relationship	Object Order	User Defined?
PO		PO		1	<input type="checkbox"/>
COMPANIES	PO	PO/COMPANIES	VENDOR	2	<input type="checkbox"/>
POLINE	PO	PO/POLINE	POLINE	3	<input type="checkbox"/>
ITEM	POLINE	PO/POLINE/ITEM	ITEM	1	<input type="checkbox"/>
POCOST	POLINE	PO/POLINE/POCOST	POCOST	2	<input type="checkbox"/>

Below the table is a 'Details' section for the selected object (PO), showing fields for 'Object', 'Parent Object', 'Object Location Path', 'Reporting Description' (Purchase Order), 'Relationship', 'Object Order' (1), and 'User Defined?'.

2. Define Database Joins and Cardinality

Next, the any maxrelationships used to create the ROS must be updated to specify their Cardinality and Database Join Type.

3. Associate Report Object Structure to Application

Finally, the Report Object Structure must be associated with the application in Application Designer. A screen shot of the new Report Object field in App Designer is shown below.

The screenshot shows the 'Application Designer' interface. At the top, there's a navigation bar with 'Bullets: (0)', 'Go To', 'Int Reports', 'Start Center', 'Profile', and 'Sign Out'. Below this is a search bar and a 'Select Action' dropdown. The main area is titled 'Applications' and shows a list of applications. The 'PO' application is selected, and its details are shown in the 'Workspace' section. The 'Report Object' field is highlighted with a red circle.

Application	Description	Main Object	Report Object	Original Application
po				
ENDPOINT	End Points	MAXENDPOINT		
REPORT	Report Administration	REPORT		
PO	Purchase Orders	PO	REP_PO	

Each of these items is discussed in more detail below.

Create Report Object Structures

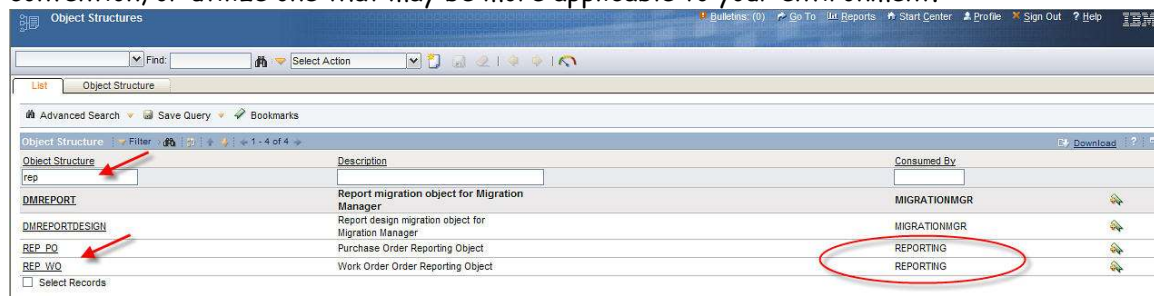
The first thing that must be put in place to enable multiple category drilldown for a QBR Report is the Report Object Structure (ROS). The ROS is enabled in the V7 Object Structure application. (This is accessible via Integration -> Object Structures)

The steps below detail how to setup a ROS for the Asset application and the business rules involved. Again, please note that the individual who is creating Report Object Structures needs to be very familiar with the Maximo Database Structure and Maxrelationships.

1. Go to the Object Structure Application. Filter on rep in the object structure field, and a few results should return. Notice two important items here

A. The Report Object Structures have a consumed by of 'REPORTING'. This is the unique attribute that identifies them as ROS. If this is not done, the ROS will not be able to be associated to an application in Application Designer. To enable this, a Value of REPORTING with a Description of 'Reporting Application' has been added to the SYNONYMDOMAIN Table for DOMAINID = 'INTUSEWITH'.

B. Secondly, it is recommended that you use a naming convention to quickly identify the ROS. The ROS delivered out of the box use the naming convention of 'REP_Application Name'. (For example, REP_PO). You can choose to either continue with this naming convention, or utilize one that may be more applicable to your environment.



Object Structure	Description	Consumed By
rep		
DMREPORT	Report migration object for Migration Manager	MIGRATIONMGR
DMREPORTDESIGN	Report design migration object for Migration Manager	MIGRATIONMGR
REP_PO	Purchase Order Reporting Object	REPORTING
REP_WO	Work Order Order Reporting Object	REPORTING

2. Next, the ROS for Asset will be built. This process is very similar to other parent - child relationship building. To start, insert a new record.

3. The top level of a ROS identifies the application where it will be used. Since this ROS is for the Asset application, whose main table is Asset (MAXAPPS.MAINTBNAME), an Object Structure called REP_ASSET will be created. The standard naming convention will be utilized, so the following values will be entered:

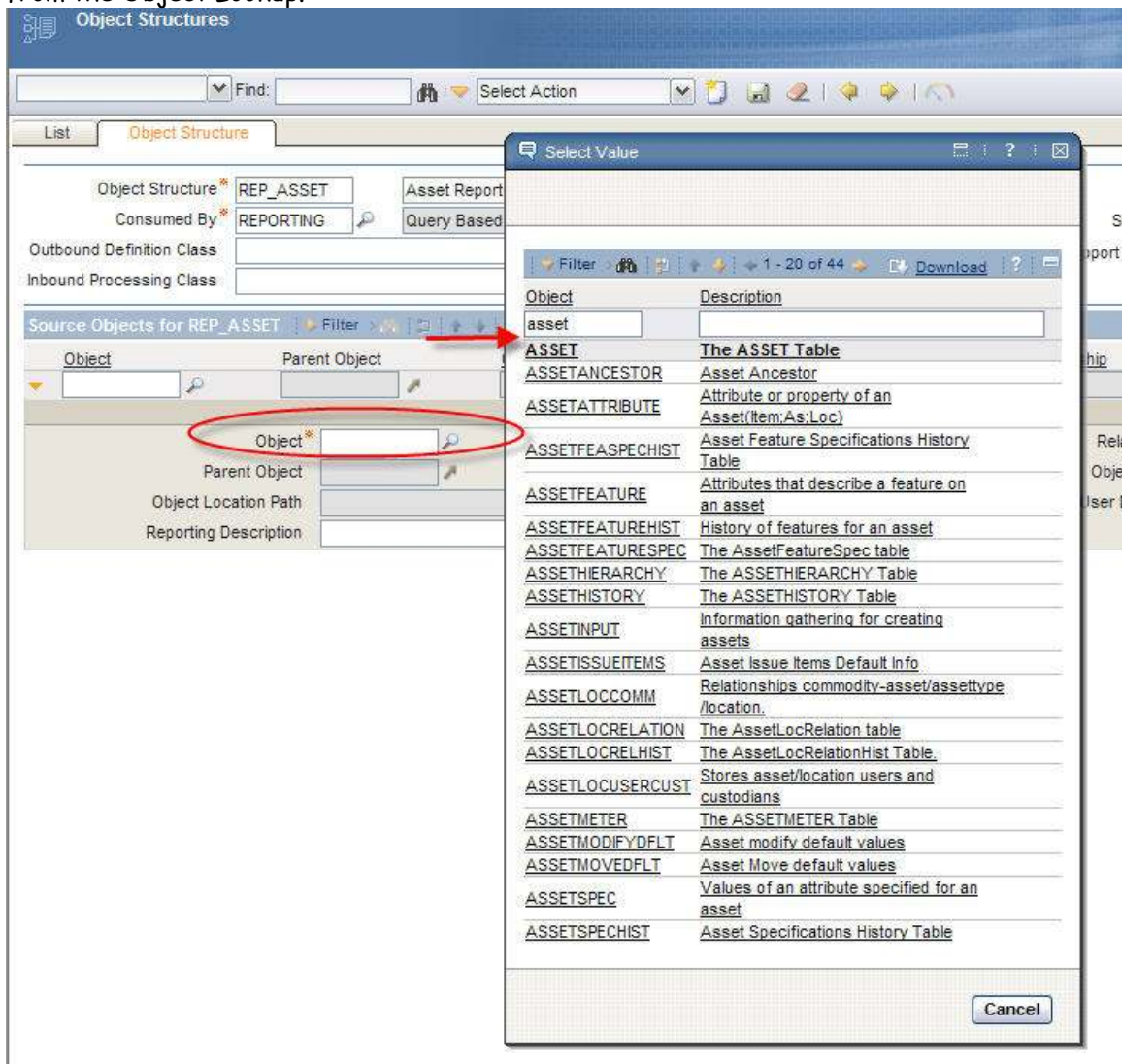
Object Structure: REP_ASSET
 Description: Asset Reporting Object
 Consumed By: REPORTING (Selected from Value List)

All other header fields will be null by default.

* Note the record can not be saved at this point. If you try to save the record, the following error will appear:

BMXAA1601E - At least one source object is required in an Object Structure.

4. Next, you must define at least one source object for the ROS. The Main Object (Table) for the application will be the Parent Source Object. Again, this will be the main table of the application (MAXAPPS.MAINTBNAME). Therefore, the Object of Asset will be selected from the Object Lookup.



5. The Parent Source Object (Asset) must (1) have a Parent Object of null and (2) have an Object Order of 1.

Also, note the Reporting Description field. The text value entered will display to the user in the Create QBR Window. Therefore, enter a text value that the user will immediately be able to recognize. After entering this information, save the record.

The screenshot shows the 'Object Structures' application window. The 'Object Structure' is 'REP_ASSET'. The 'Consumed By' is 'REPORTING'. The 'Outbound Definition Class' is 'Query Based Reports'. The 'Inbound Processing Class' is empty. The 'Source Objects for REP_ASSET' table shows one object: 'ASSET'. The 'Details' section for the 'ASSET' object shows: 'Object' is 'ASSET', 'Parent Object' is empty, 'Object Location Path' is 'ASSET', 'Reporting Description' is 'Asset', 'Relationship' is empty, 'Object Order' is '1', and 'User Defined?' is checked. Red arrows point to the 'Object', 'Parent Object', 'Object Location Path', 'Reporting Description', and 'Object Order' fields.

Object	Parent Object	Object Location Path	Relationship
ASSET		ASSET	

Object*	Parent Object	Object Location Path	Reporting Description	Relationship	Object Order	User Defined?
ASSET		ASSET	Asset		1	<input checked="" type="checkbox"/>

Next, any child or grandchildren categories must be defined as Source Objects to the parent. These source objects are also known as the categories for the application's QBR. They are the database tables (objects) related to the parent via maxrelationships.

In our example, two children will be created for Asset: Locations and Spare Parts. So, the Asset ROS will look like

Asset
 Locations
 Spare Parts

6. To do this, click New Row in the Source Object Section. In the object field, click on the lookup and select the **LOCATIONS** value.

The screenshot shows the 'Object Structures' application interface. In the background, the 'Source Objects for REP_ASSET' section is visible, with a red circle highlighting the 'Object*' field and a red arrow pointing to it. The 'Select Value' dialog box is open, displaying a list of objects and their descriptions. The object 'LOCATIONS' is highlighted in the list.

Object	Description
loc	
ASSETLOCCOMM	Relationships commodity-asset/assettype/location.
ASSETLOCRELATION	The AssetLocRelation table
ASSETLOCRELHIST	The AssetLocRelationHist Table.
ASSETLOCUSERCUST	Stores asset/location users and custodians
LABINVLOCCHANGE	Non persistent table for changing the LabInvLoc
LOCANCESTOR	The Location Ancestor Look-up table
LOCATIONMETER	Information for meters attached to locations
LOCATIONS	The Locations Table
LOCATIONSPEC	Values of an attribute specified for a location
LOCATIONUSERCUST	Stores info about users and custodians of location
LOCAUTH	The Location Authorization table
LOCCHANGESTATUS	For Location "Change Status" page
LOCHIERARCHY	The Location Hierarchy table
LOCKOUT	Operation to put locking device in required state
LOCLEADTIME	The location Lead Time table
LOCMETERREADING	Readings and observations recorded on meters.
LOCOPER	The Functional Location Information Table
LOCSTATUS	The Location Status table
LOCSYSTEM	The Systems of Locations table
MULTIASSETLOCCI	Multi Asset, location and Cis for workorder

The child, Locations, has a parent of ASSET. Therefore, select ASSET from the lookup on the Parent Object Field.

The screenshot shows the 'Object Structures' window. The 'Object Structure' is 'REP_ASSET' and the 'Consumed By' is 'REPORTING'. The 'Source Objects for REP_ASSET' table lists 'ASSET' and 'LOCATIONS'. The 'Parent Object' field for 'LOCATIONS' is currently empty. A red circle highlights the 'Parent Object' field, and a red arrow points to the 'ASSET' option in the 'Select Fields' dialog box. The 'Object Location Path' is currently 'LOCATIONS'.

Object	Parent Object
ASSET	
LOCATIONS	

Object*	Parent Object
LOCATIONS	

Object Location Path: LOCATIONS

Reporting Description:

After selecting the Parent Object of Asset, the read only field of Object Location Path is updated to be 'ASSET/LOCATIONS' to indicate the hierarchy path.

7. Next, select the Relationship between the Parent Asset and the Child Location Table by clicking on the relationship lookup. This lookup displays values from the maxrelationship table.

*select * from maxrelationship where parent = 'ASSET' and child = 'LOCATIONS'*

Relation	RELSQLWHERE
ASSET LOCATIONS	location=:location and siteid = :siteid
LOCATION	location = :location and siteid = :siteid
NEWLOCATION	location = :newlocation and siteid = :newsite

Select the correct relationship for the ROS you are creating.

Notes: Best practices for selecting the correct relationship are contained at the end of this section.

8. Enter a Reporting Description for this category that the user will identify in the Create Window UI. Additionally, enter the Object Order of the Child to the Parent. Click Save.

Object Structure: REP_ASSET (Asset Reporting Object)

Consumed By: REPORTING (Query Based Reports)

Source Objects for REP_ASSET:

Object	Parent Object	Object Location Path	Relationship
ASSET		ASSET	
LOCATIONS	ASSET	ASSET/LOCATIONS	ASSET_LOCATIONS

Details for LOCATIONS:

- Object: LOCATIONS
- Parent Object: ASSET
- Object Location Path: ASSET/LOCATIONS
- Reporting Description: Locations
- Relationship: ASSET_LOCATIONS
- Object Order: 1
- User Defined?: ☒

9. After saving, Click New Row again and repeat this process of adding a Source Object for the Child Spare Parts. Notice that when you click on the Parent Object lookup this time, you can start to view how the ROS hierarchy is being built.

Object Structures

Find: Select Action

List **Object Structure**

Object Structure* REP_ASSET Asset Reporting Object

Consumed By* REPORTING Query Based Reports

Outbound Definition Class

Inbound Processing Class

Source Objects for REP_ASSET Filter 1 - 3 of 3

Object	Parent Object	Object Location Path
ASSET		ASSET
LOCATIONS	ASSET	ASSET/LOCATIONS
SPAREPART		SPAREPART

Object* SPAREPART

Parent Object

Object Location Path SPAREPART

Reporting Description

Select Fields

- ASSET
- LOCATIONS

Spare Parts is a child of Asset, so select Asset for the Parent Object. Then, select the correct relationship between the parent Asset and the child Spare Parts and click Save.

Object Structures

Find: Select Action

List **Object Structure**

Object Structure* REP_ASSET Asset Reporting Object

Consumed By* REPORTING Query Based Reports

Outbound Definition Class

Inbound Processing Class

Source Objects for REP_ASSET Filter 1 - 3 of 3

Object	Parent Object	Object Location Path	Relationship
ASSET		ASSET	
LOCATIONS	ASSET	ASSET/LOCATIONS	ASSET_LOCATIONS
SPAREPART	ASSET	ASSET/SPAREPART	SPAREPART

Details

Object* SPAREPART

Parent Object ASSET

Object Location Path ASSET/SPAREPART

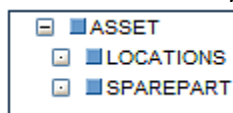
Reporting Description Spare Part

Relationship SPAREPART

Object Order* 2

User Defined? ☒

The ROS Hierarchy you have built looks like this.



Excluding Persistent Fields from Source Objects

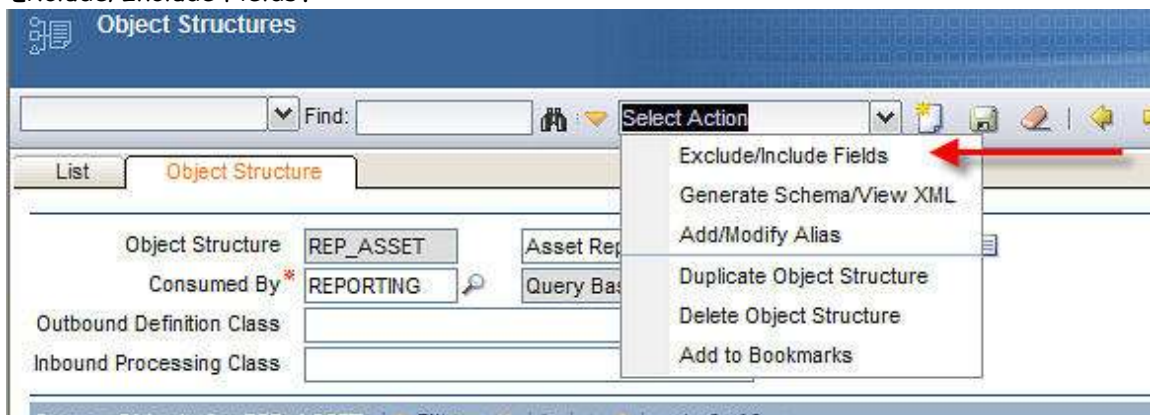
This next section is optional. However, it is highly recommended that you review its functionality as it will improve the 'Usability' features of Ad Hoc Reporting for your users.

By default, when a ROS is created, the fields displayed to a user in each Category will be the Persistent Fields of the Object. Any non-persistent object fields will not be available in the ROS and Ad Hoc Reporting.

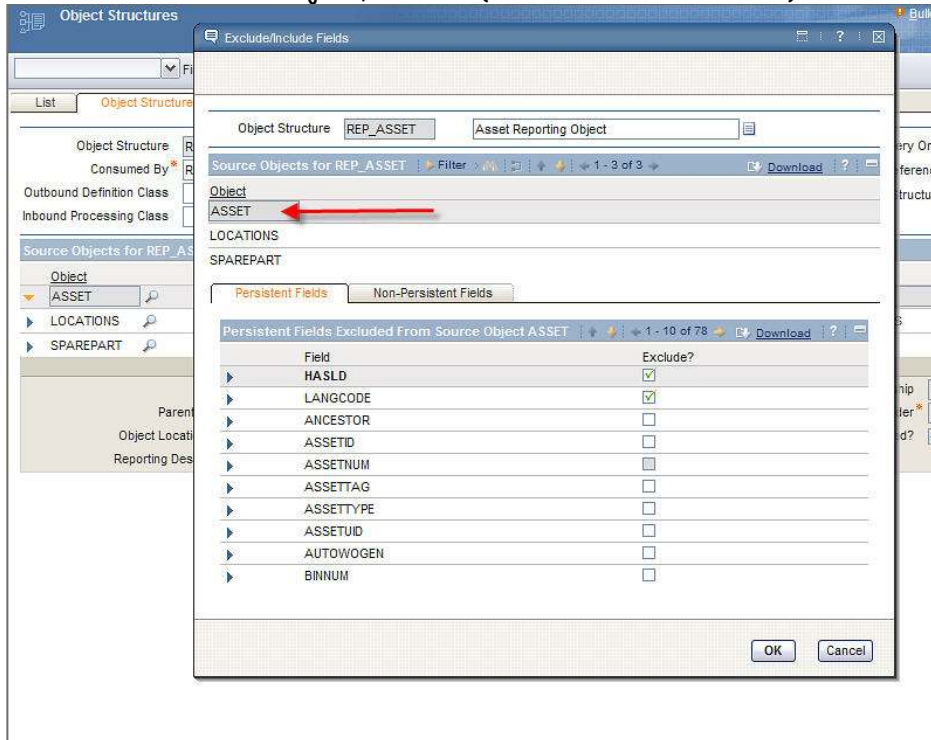
Please note however, that the number of fields for each category could be very large. Additionally, some fields may repeat themselves between the parent and the child. (ex: Asset Number exists in both the Parent Asset Table and the Child Locations Table.)

Therefore, to reduce these potentially massive amounts of fields that the user has to filter through, the Object Structure Action of Excluding/Including fields can be used. This functionality enables the administrator to refine the field selection for each Source Object used by Reporting. Without this functionality, the vast amounts of data available to the user creating his QBR Report could become un-manageable.

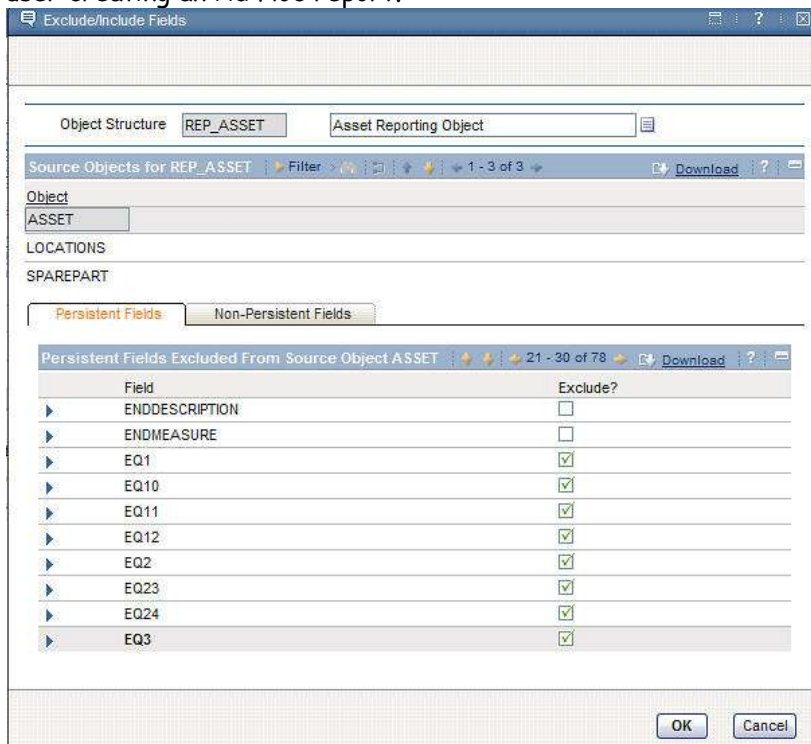
This is shown in the screen shot below. From the Action Menu, the user selects 'Exclude/Include Fields'.



For each of the Source Objects, the Admin can enable the check box to Exclude all the fields he does not want to display for the Source Object. The screen shot below shows the Parent Asset Source Object, 2 fields (HASLD and LANGCODE) are excluded by Default.



The administrator then Excludes a few extra asset fields that would not be of value to the user creating an Ad Hoc report.



Once the excluded fields are noted and then saved, the window is updated to what is shown below.

Exclude/Include Fields

Object Structure REP_ASSET Asset Reporting Object

Source Objects for REP_ASSET Filter 1 - 3 of 3 Download

Object
ASSET
LOCATIONS
SPAREPART

Persistent Fields Non-Persistent Fields

Persistent Fields Excluded From Source Object ASSET 1 - 10 of 78 Download

Field	Exclude?
EQ2	<input checked="" type="checkbox"/>
HASLD	<input checked="" type="checkbox"/>
EQ10	<input checked="" type="checkbox"/>
EQ12	<input checked="" type="checkbox"/>
EQ23	<input checked="" type="checkbox"/>
EQ1	<input checked="" type="checkbox"/>
EQ11	<input checked="" type="checkbox"/>
EQ3	<input checked="" type="checkbox"/>
LANGCODE	<input checked="" type="checkbox"/>
EQ24	<input checked="" type="checkbox"/>

OK Cancel

Again, this is an optional mechanism that can be utilized to reduce the potentially overwhelming number of persistent database fields displayed to the user during Ad Hoc report creation.

Any excluded fields are held in the MAXINTOBJCOLS table. Therefore, only the *persistent* fields that are NOT contained in the MAXINTOBJCOLS table will display as available Category Fields.

Note that even though Non-Persistent fields are displayed in this dialog in the Object Structure application, they can not be used for Reporting Objects. This is because reports execute directly against the database (persistent fields). Reports do not execute against the objects, therefore, non-persistent fields can not be used in Ad Hoc Reporting.

What happens if a ROS for an Application is not defined

Applications do not need to have Reporting Object Structures (ROS) defined. As an example, in 7.1.1.4 only two Reporting Object Structures are defined out of the box (Work Order and Purchase Order). All other Object Structures for Reporting are not defined.

The screen shot below shows an example of what would display if there was *no* Object Structure defined for Reporting. When the user clicks on 'Create Report', the category drilldown only displays a single level. No children or grandchildren categories are enabled. This is essentially the functionality that was delivered in EAM 7.1. Additionally, because the Object Structure is not defined for this application, the top level description shown on the left hand side below displays using the default value of MAXAPPS.DESCRPTION Detail. In this case, it is 'Job Plans Detail'.

The screenshot shows the 'Query Based Report' window. At the top, there are tabs for 'Select', 'Sort', and 'Schedule'. Below these is a yellow information box with instructions on how to apply the current query and filter. The 'Query to Use in the Report' section has a checkbox 'Apply the Current Query and Filter from the Application?' which is checked. The 'Available Fields' section shows a list of fields with their descriptions and values. The 'Selected Fields' section shows a table with columns for Column Order, Report Label, Field Value, and Category.

Query Based Report

Select **Sort** **Schedule**

To apply the query and filter from the current application to your report, select the Apply the Current Query and Filter check box. The query is saved to the report, and the report uses this saved query every time that you run the report.

Select the fields you want to include in your report by using the arrow icons. To see all of the categories and fields that are available, expand the drilldown on the left. You can select only one category that contains a multiple relationship to the main object.

Query to Use in the Report

Apply the Current Query and Filter from the Application? ☒

Job Plans Detail

Available Fields

Field Description	Field Value
Calendar	CALENDAR
Class Structure	CLASSSTRUCTUREID
Crew	CREWID
Downtime	DOWNTIME
Flow Action	FLOWACTION
Flow Action Assist	FLOWACTIONASSIST
Flow Controlled	FLOWCONTROLLED
Has Long Description?	HASLD
Interruptible	INTERRUPTIBLE
JOBPLANID	JOBPLANID

Add All

Selected Fields

Column Order	Report Label	Field Value	Category
1	Job Plan	JPNUM	Job Plans Detail
2	Description	DESCRIPTION	Job Plans Detail
3	Duration	JPDURATION	Job Plans Detail
4	Supervisor	SUPERVISOR	Job Plans Detail
5	Status	STATUS	Job Plans Detail
6	Template Type	TEMPLATETYPE	Job Plans Detail
7	Organization	ORGID	Job Plans Detail

Submit **Cancel**

Best Practices Notes on Creating Report Object Structures

1. Individuals creating Report Object Structures must be very familiar with the database structure and maxrelationships. Additional information on this can be obtained from the Entity Relationship Diagram (ERD) for V7. This diagram can be obtained at IBM's OPAL Site at the URL below.

<http://www-01.ibm.com/software/brandcatalog/portal/opal/details?catalog.label=1TW10MA25>

2. Each Source Object must have a relationship to the Parent Source Object to be valid. Without the relationship, the tables can not be joined, causing the QBR Report to error out.

This is shown by continuing with the Asset ROS. The ATTENDANCE Source Object will be added as a child of ASSET. The ATTENDANCE Table has no relationship to the Asset Parent. When you try to create this ROS entry, no relationships are displayed in the relationship lookup. Therefore, Attendance can not be added as a child of Asset in the ROS.

Object Structures

Find: [] Select Action []

Object Structure: REP_ASSET Asset Reporting Object
Consumed By: REPORTING Query Based Reports

Outbound Definition Class []
Inbound Processing Class []

Query Only? [] User Defined? []
Self Reference? [] Configurable? []
Support Flat Structure? [] Alias Conflict? []

Source Objects for REP_ASSET

Object	Parent Object	Object Location Path	Relationship	Object Order	User D
ASSET	ASSET	ASSET		1	[x]
LOCATIONS	ASSET	ASSET/LOCATIONS	ASSET_LOCATIONS	1	[x]
SPAREPART	ASSET	ASSET/SPAREPART	SPAREPART	2	[x]
ATTENDANCE	ASSET	ASSET/ATTENDANCE		3	[x]

Details

Object: ATTENDANCE
Parent Object: ASSET
Object Location Path: ASSET/ATTENDANCE
Reporting Description: []

Relationship: []
Object Order: 3
User Defined? [x]

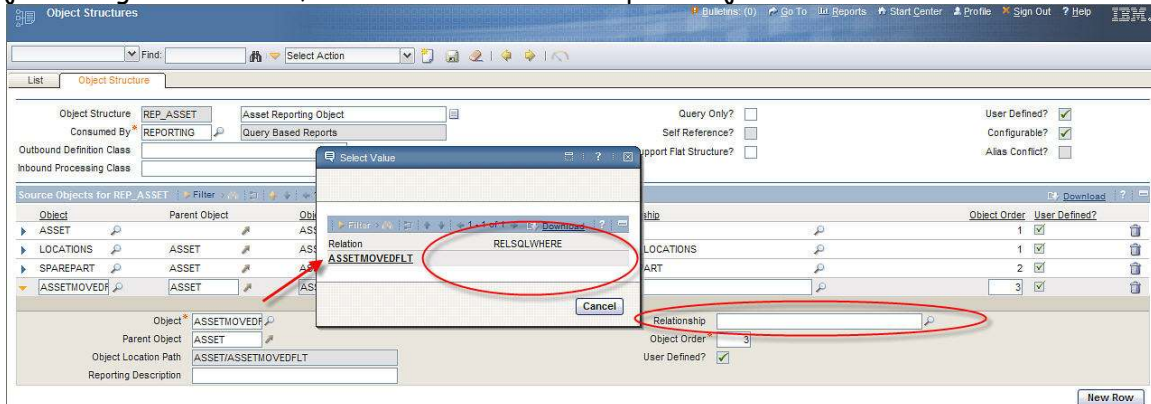
Select Value

...No rows to display...

Cancel

3. Source Objects must be joined to their parents with relationships where the database sql is defined in its maxrelationship. If the source object has a null database sql, it can not be used in a reporting object structure as it will give invalid results.

This is shown below using our Asset ROS example. A Child Source Object of ASSETMOVEDFLT is added to the Parent Asset Source Object. When clicking on the relationship lookup, notice that its database sql is null. Even though a maxrelationships exists between the two tables, there is no database sql on how those two tables should be joined together. There, it can not be used in a Report Object Structure.



4. The same object can not be added multiple times in a single Report Object Structure. An example of this is the ROS of Work Order. The parent Source Object is WORKORDER, and has a number of children, including Planned Labor and Actual Labor. Both Planned Labor and Actual Labor, have a child of Labor. However, since an object can only be used once in a ROS, Labor can only be added to either Planned Labor or Actual Labor.

Below is an example of a hierarchy that **can not** be used as Labor is repeated twice.

Work Order
 Assets
 Locations
 Planned Labor
 Labor
 Actual Labor
 Labor

Below is an example of a hierarchy that can be used:

Work Order
 Assets
 Locations
 Planned Labor
 Labor
 Actual Labor
 Planned Material

5. There are no limits to the numbers of source objects (categories) that a client can create for a ROS. As long as each source object has a valid maxrelationship, it can be added as a category.
6. ROS can be created against database views along with database tables, as long as the database views are valid Maximo Objects. An example of a Parent Object that is a database view is TOOLITEM for the application Tools.

Define Database Joins and Cardinality

The Report Object Structures create a hierarchy of related categories for an application. The ROS utilize multiple source objects or categories to form relationships between the multiple tables.

Once the ROS are created, the remaining information on how to build the report sql query for the Ad Hoc report needs to be defined. This information is a very critical component of the process as it determines what data is returned in a report. If it is set incorrectly, the data returned to the user will either be incorrect or un-usable.

The two fields used to complete the ROS information are the Database Join and Cardinality. The values for these fields are held in MAXRELATIONSHIPS.

MAXRELATIONSHIP.CARDINALITY

The Cardinality is a database term defining the type of relationship. In the case of reporting, there are two types: One-to-one or One-to-many. One-to-one relationships are known as Single Relationships, whereas One-to-many are Multiple Relationships.

If it is a single relationship, it means it is a one to one relationship. Using our example, the Asset-Location Relationship is a single relationship as only a single location can be associated to an Asset. This can be seen from within the Asset application in the screen shot below. Only a single location can be associated to the parent Asset.

The screenshot shows the 'Assets' application interface. The 'Asset' tab is selected, and the 'Asset' field is circled in red, showing the value '11430'. The 'Status' is 'OPERATING'. The 'Location' field is highlighted with a red arrow, showing the value 'BR430'. The 'Details' section shows the 'Parent' as '11400' and the 'Location' as 'BR430'. The 'Bin' field is empty. The 'Rotating Item' is 'PUMP100'. The 'Condition Code' and 'Meter Group' are empty. The 'Usage' field is empty.

Field	Value
Asset	11430
Status	OPERATING
Linear?	<input type="checkbox"/>
Parent	11400
Location	BR430
Bin	
Rotating Item	PUMP100
Condition Code	
Meter Group	
Usage	

If it is a multiple relationship, it means it is a one to many relationship. The Asset-Spare Parts Relationship is a single to multiple relationship. For each asset (single) there can be multiple Spare Parts records (multiple).

The screenshot shows the 'Assets' application interface. The 'Spare Parts' tab is selected, and the 'Asset' field is circled in red, showing the value '11430'. The 'Parent' is '11400'. The 'Subassemblies' section shows a table with one record: '23972' (Motor- 10hp/1750rpm/TEFC/254T Frame/440v/3) at location 'BR431'. The 'Spare Parts' section shows a table with six records, with the first record circled in red: '11453' (Seal, Mechanical, Self Aligning- 1 In ID) with a quantity of '1.00'.

Asset	Description	Location
23972	Motor- 10hp/1750rpm/TEFC/254T Frame/440v/3	BR431

Item	Description	Quantity
11453	Seal, Mechanical, Self Aligning- 1 In ID	1.00
12853	Impeller- 4-1/2 Inch Dia	1.00
XMP-9500	Gasket- AR46	1.00
G-1000	Bearing, Pillow Block, Fafnir- 1 In ID	2.00
117084	Shaft- 1 Inch Dia	1.00
20778	Housing- Centrifugal Pump	1.00

1. The default value is UNDEFINED.
2. If a value is undefined and used in a ROS, the QBR Functionality assumes it is a Multiple Relationship.

During the report creation process, as the user adds fields to the Selected Field Section, their relationships are evaluated to determine if they are single or multiple relationships. Any number of categories with Single Relationships can be added to the QBR. However, only 1 Category with a Multiple Cardinality Can be included in a Single QBR.

[illegible]

70

MAXRELATIONSHIP.DBJOINREQUIRED

As mentioned earlier, the type of database join between two tables determines the data that is returned in a report. It is probably one of the most important aspects in defining the report relationships.

There are 2 types of joins. A required database join, and an optional, or left outer join. The type of join used in the maxrelationship will determine the type of data returned in the Ad Hoc Report.

If the join is defined as required, or an inner join, a '1' will be used in the MAXRELATIONSHIP.DBJOINREQUIRED field. This type of join will only return results that have corresponding data in both tables. These inner joins limit the data that is returned.

If the join is defined as NOT required, or an outer join, its value will be '0'. This is the default value. This type of join will return results that may or may not have corresponding data.

Looking further at the relationship between the PO to PO Line table.

If the MAXRELATIONSHIP.DBJOINREQUIRED = '1', only POs with entries in the POLINE table will be returned in the report.

If the MAXRELATIONSHIP.DBJOINREQUIRED = '0', any PO - with or without entries in the POLINE table - will be returned in the report.

Using maxdemo data, this can quickly be illustrated by using PO #'s 1000 and 1067. PO 1000 has 3 entries in the POLINE table, whereas 1067 does not have any.

If you execute a QBR Report by selecting field values from both PO and POLINE Categories against these 2 POs

And the DBJOINREQUIRED = '0', 4 results will return (3 for 1000, 1 for 1067)

And the DBJOINREQUIRED = '1', 3 results will return (3 for 1000 only)

This is correct behavior.

Notes on Database Joins and Cardinality

1. No UI will be available in this initial release to update these 2 fields. Any updates to these fields must be made thru a SQL Editor.

Therefore, for our Asset ROS example, the scripts below would be used. The Asset to Locations Relationship is an outer join, with a single cardinality. The Asset to Spare Parts Relationship is also an outer join, with a multiple cardinality.

```
update maxrelationship set dbjoinrequired = '0', cardinality = 'SINGLE' where name =  
'ASSET_LOCATIONS' and parent = 'ASSET' and child = 'LOCATIONS';
```

```
update maxrelationship set dbjoinrequired = '0', cardinality = 'MULTIPLE' where name =  
'SPAREPART' and parent = 'ASSET' and child = 'SPAREPARTS';
```

Note: For base languages other than English, check the SYNONYMDOMAIN for the correct value of cardinality

```
select value from synonymdomain where domainid = 'RPTCARDINALITY' and maxvalue =  
'MULTIPLE'
```

2. As an administrator sets the MAXRELATIONSHIP values, he may want to execute QBR reports to insure he is getting back the expected results. However, if he makes a change to either of his fields, he **MUST** close down the QBR/Reporting Window in order for the changes to take affect.

This occurs because the QBR Functionality caches queries so it doesn't need to re-fetch data that it expects hasn't changed (ex. data from MAXRELATIONSHIP) This is done for performance reasons.

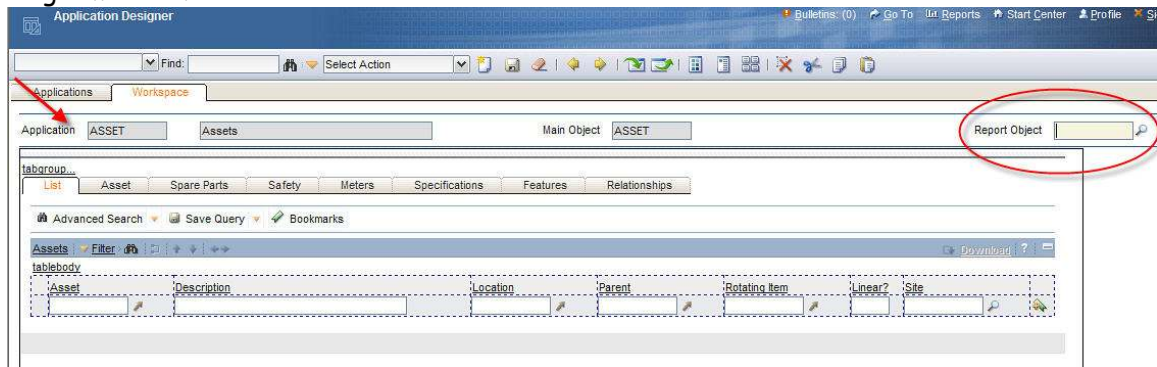
Associate ROS to Application

After the Report Object Structure has been defined, and the maxrelationships updated for their database joins and cardinality, the last thing that must be done is the ROS must be associated with an application. The Application Designer is used to identify which ROS is used for individual applications. It displays a field on its list tab called Report Object. This field is defined as MAXAPPS.REPORTOBJECT, and has a remarks value of 'Report Object Structure used for Ad Hoc Reporting'.

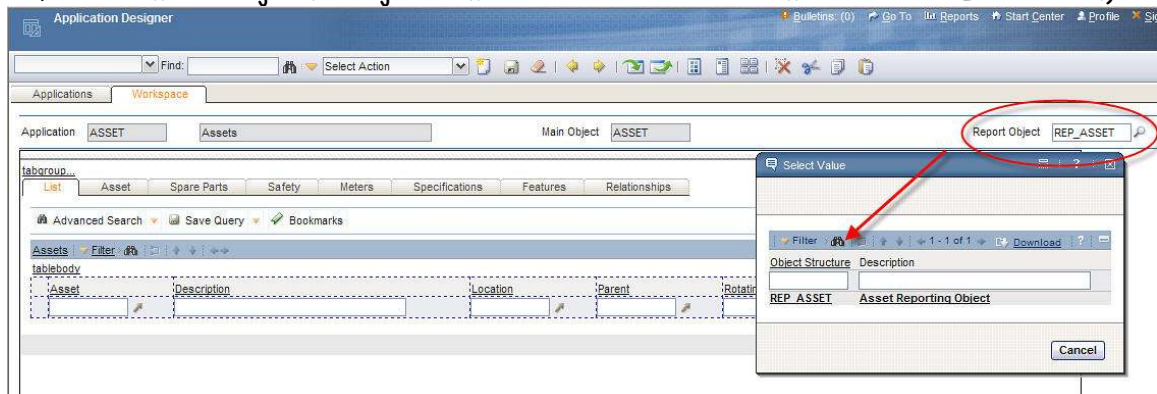
The Report Object field identifies the Object Structure used by the Application for QBR. There are no limitations to the number of Object Structures that can be created for an application - but only one Object Structure can be used for each application's QBR.

The Report Object Field is persistent, not required, and does not have any default values. It is only visible in the App Designer - it is not visible from the individual applications.

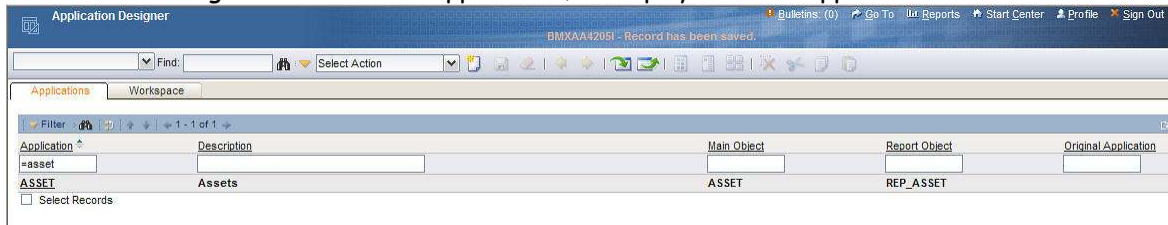
To define the Report Object Field, click on the Workspace tab of the application. The 'Report Object' displays at the header level after the 'Main Object' Field, circled in the diagram below.



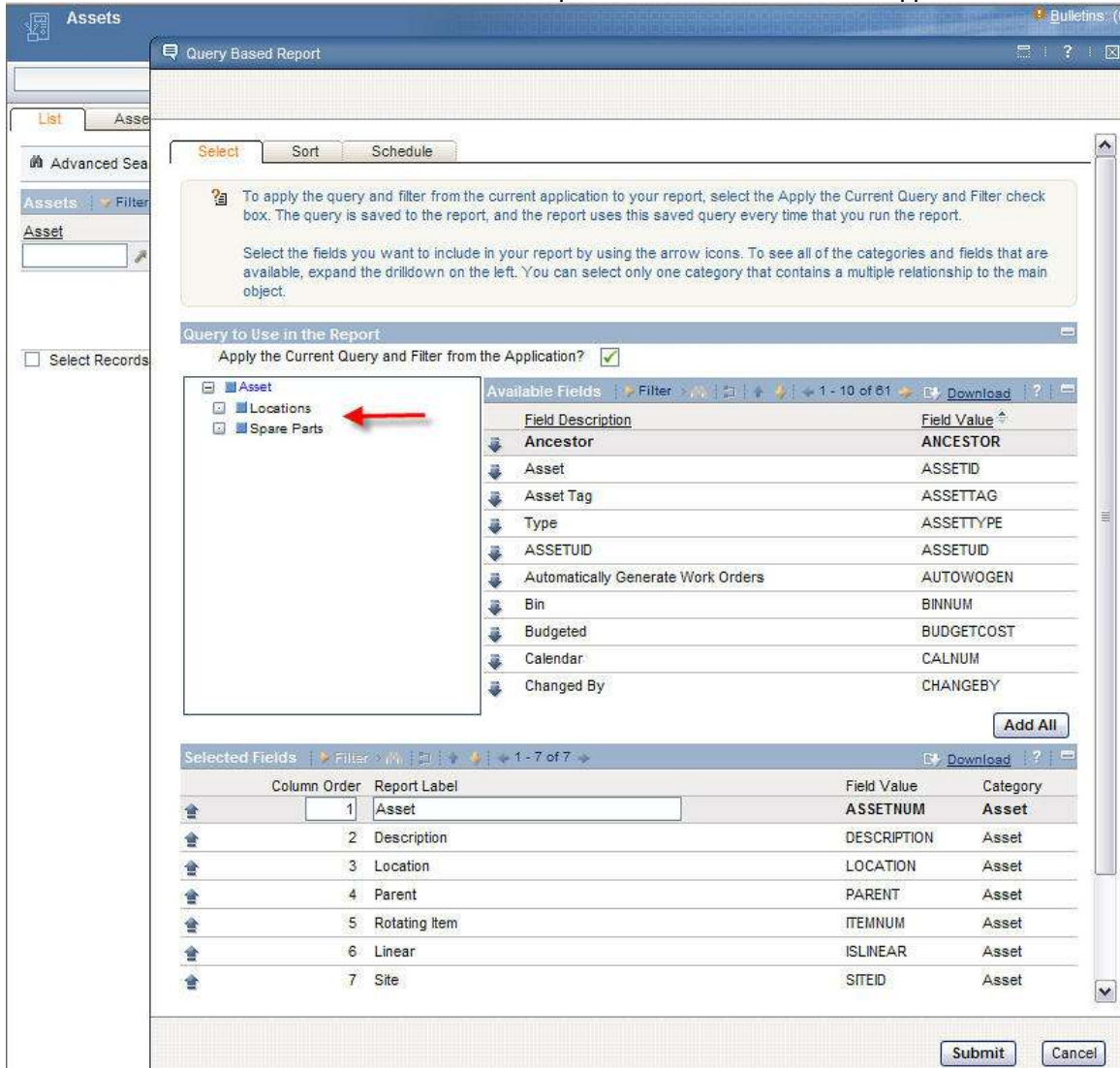
A lookup is available on this field, which displays all Report Object Structures. (This is defined as maxintobject.intobjectname where the use with domain value is REPORTING.)



After associating the ROS to the application, it displays on the Applications Tab as below.

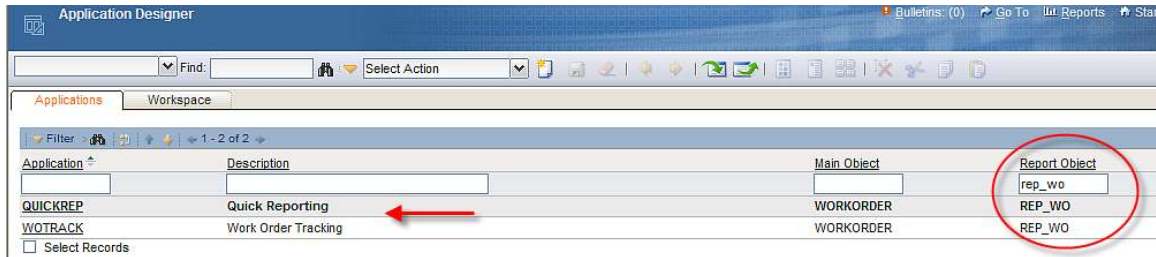


And then will be available from the 'Create Report' Window of the Asset application.



Notes on Associating ROS to Applications

The same ROS can be associated with multiple applications, as long as the ROS has the same main table as the application. The example below shows the REP_WO ROS applied to both the Quick Reporting and Work Order Tracking applications, as both share the same main table (object) or Workorder.

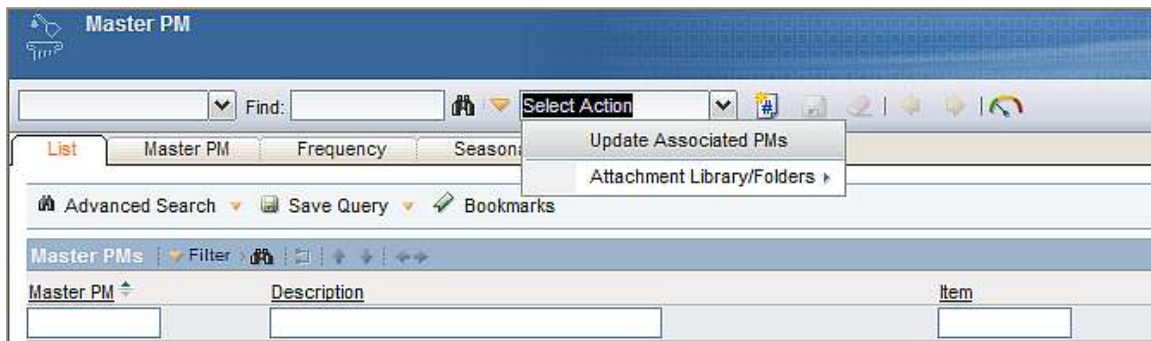


Application	Description	Main Object	Report Object
QUICKREP	Quick Reporting	WORKORDER	REP_WO
WOTRACK	Work Order Tracking	WORKORDER	REP_WO

Adding QBR Functionality to New or Cloned Applications

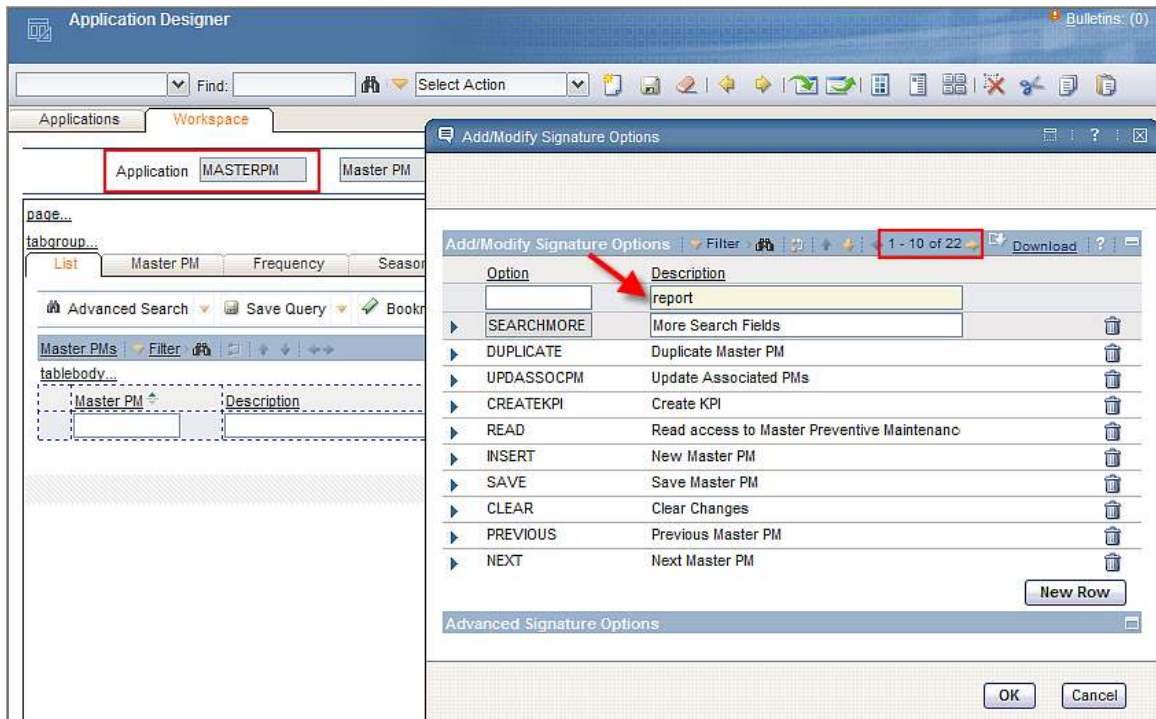
Some applications may not be enabled for Ad Hoc Reporting out of the box because they may be administrative intensive, a non-standard application or may utilize complex methods for determining its main table. Examples of some of the applications not enabled for Ad Hoc Reporting include Sets, Currency Codes, Exchange Rates, and Self Service Applications.

However, you may want to enable QBR Functionality for one of these applications, or for a new or cloned application that you have created. The steps below detail an example of how to do this using the Master PM Application as an example. The screen shot below shows that the QBR functionality is not available for this application.

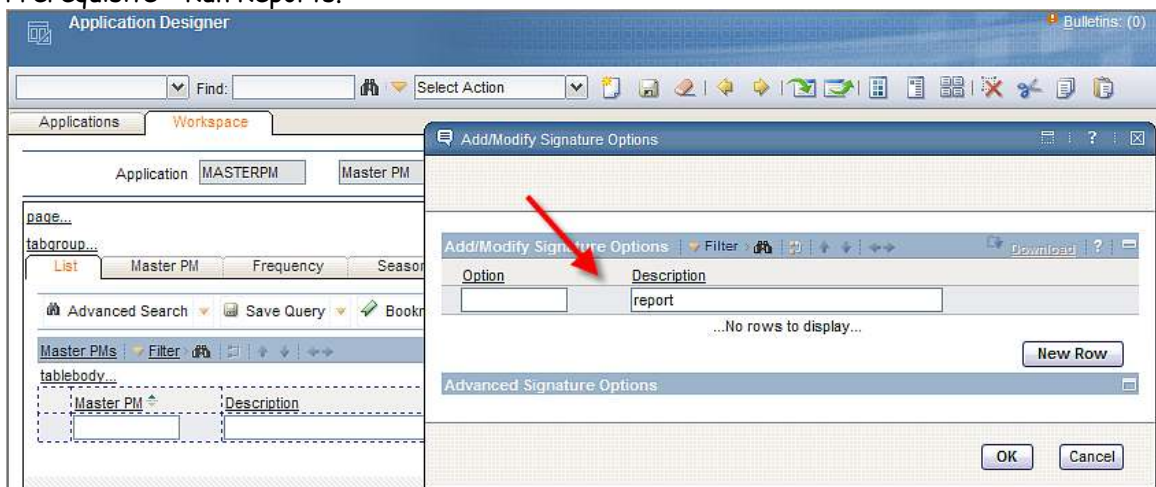


Note: In order to do this, the application must have the RUNREPORTS Security option enabled. If this security option is not available, it must first be added before adding the Create Reports Option.

First, verify that RUNREPORTS Security Option is enabled for the application. To do this, access Application Designer and filter for the application. From the action menu, select Add/Modify Signature Options. Under Description - enter a value of report to see if any Sig Options are enabled.



In this case, no sig options are enabled, so they all will be created - including the Prerequisite - Run Reports.



Click New Row, and add the first sig option as shown below for: RUNREPORTS

Application Designer

Find: Select Action

Applications Workspace

Application MASTERPM Master PM

page... tabgroup... List: M

Advanced Master PMs tablebody... Master PM

Add/Modify Signature Options

Add/Modify Signature Options Filter 1 - 1 of 1 Download ?

Option	Description
	report
RUNREPORTS	Run Reports

Option * RUNREPORTS

Description Run Reports

Option Also Grants

Option Also Revokes CREATEREPT

Prerequisite

E-signature Enabled? ☐

Visible? ☒

New Row

Advanced Signature Options

OK Cancel

Repeat this process for the remaining two sig options: DELETEREPT and CREATEREPT

Add/Modify Signature Options

Add/Modify Signature Options Filter 1 - 2 of 2 Download

Option	Description
	report
▶ RUNREPORTS	Run Reports
▼ DELETEREPT	

Option* DELETEREPT

Description Delete Report

Option Also Grants

Option Also Revokes

Prerequisite

E-signature Enabled? ☐

Visible? ☒

Add/Modify Signature Options

Add/Modify Signature Options Filter 1 - 3 of 3 Download

Option	Description
	report
▶ RUNREPORTS	Run Reports
▶ DELETEREPT	Delete Report
▼ CREATEREPT	Create Ad Hoc QBR Reports

Option* CREATEREPT

Description Create Ad Hoc QBR Reports

Option Also Grants

Option Also Revokes PUBLICREPT

Prerequisite RUNREPORTS

E-signature Enabled? ☐

Visible? ☒

Click OK and save the changes.

Next, add the Run Report Action to the Action menu for the Master PM application. Select "Add/Modify Select Action Menu". Input values as shown below and save.

The screenshot shows the 'Add/Modify Select Action Menu' dialog in the Application Designer. The left pane lists various actions, and the right pane shows the configuration for the 'RUNREPORTS' action. The configuration fields are as follows:

Field	Value
Element Type	OPTION
Key Value	RUNREPORTS
Header Description	
Position	9,001
Subposition	0
URL	
Image	
Visible?	<input checked="" type="checkbox"/>
Tabs	ALL

Buttons at the bottom include 'New Row', 'OK', and 'Cancel'.

Once the new report security options and menu option have been enabled, follow the standard Application Designer Procedures for enabling the application updates. You can then grant security privileges to your selected Security Groups via the Security Group application.

Applications not enabled for QBR Reporting - Out of the Box

Some applications are not enabled for Ad Hoc Reporting because they may be a non-standard application or they utilize complex methods for determining its main table. Therefore, the 'create reports' functionality has not been enabled for these applications.

The applications that are not currently enabled for Query Based Reporting include:

Under Administration

Sets

Bulletin Board

Communication Templates

Adapter Conversion

Manufacturer Conversion

Operations System Conversion

Processor Conversion

Software Conversion

Software Suite Setup

Software Usage Setup

Reconciliation Tasks

Task Filters

Link Rules

Comparison Rules

CI Link Results

CI Reconciliation Results

Conditional Expression Manager

CI Types

Work View

Under Assets

Software License View

Under Contracts

Terms and Conditions

Under Financials

Currency Codes

Exchange Rates

Cost Management

Under Integration

Object Structures

Publish Channels

Invocation Channels

Enterprise Services

Web Services Library

End Points

External Systems
Logical Management Operations
Integration Modules
Launch in Context
Message Tracking
Message Reprocessing

Under Inventory
Condition Codes
Storerooms

Under Planning: Safety Precautions

Under PM" Master PM

Under Purchasing
Companies
Company Master
Terms and Conditions

Under Self-Service
Self Service - Desk Top Requisitions
Self Service - Service Requests

Under Work Order: Assignment Manager

Under Service Desk: Ticket Templates

Under System Configuration
System Properties
Logging
Domains
Application Designer
Communication Templates
Actions
Roles
Escalations
Work Flow Administrator
Cron Task Setup
Email Listeners
Web Services Library
Launch in Context
Migration Groups

Additional References

There are a large number of report reference materials available for you. These guides include all areas of reporting from Upgrades, Administration, Configuration, Design, Development and Execution. To locate the latest versions of these guides, access this IBM Maximo Wiki Page:

<https://www.ibm.com/developerworks/wikis/display/maximo/Report+Reference+Materials>

or its shortened url of <http://bit.ly/niokIv>

This page contains the latest listing of report reference materials, including description, revision levels and hyperlinks to the documentation

Report Reference Materials

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Added by [PamDenny](#), last edited by [PamDenny](#) on Jan 05, 2012 ([view change](#))
Labels: (None) [EDIT](#)

Maximo Asset Management

[Home](#) > [Reports](#) > Report User Documentation

Report User Documentation

The tables below detail the report documentation currently available. This documentation is categorized into detail, planning, development, customization and integration guides. Additionally, an overview of the guide is provided, along with its current revision level. All documentation referenced is available on IBM's support site at the url below by searching on the document reference number or title.

http://www-947.ibm.com/support/entry/portal/Overview/Software/Tivoli/Maximo_Asset_Management

- 1 [Report Detail Guides](#)
- 2 [Report Planning and Upgrade Guides](#)
- 3 [Report Development Guides](#)
- 4 [Report Customization Guides](#)
- 5 [Report Integration Guides](#)

Report Detail Guides

Document Name	Description	Version	Reference Number	Revision #	Last Posting Date	BiLog* Posting
V75 ReportBooklet	Contains listings, file names, descriptions, details on parameters, formatting (grouping, sorting) and a pdf copy of each of the OOB (Out of the Box) Delivered Reports.	7.5	1497942		4/28/2011	Delivered Reports
V71 ReportBooklet	Contains listings, file names, descriptions, details on parameters, formatting (grouping, sorting) and a pdf copy of each of the OOB (Out of the Box) Delivered Reports.	7.1	1305005	4	12/28/2009	

Revision Levels:

Revision 5 - September 2012

Updates include (1) Added information on Security Best Practices (2) Added reference material section (3) Included text for error messages for searching ease (4) Miscellaneous text updates for clarification

Revision 4 - February 2010

More details on exporting Ad Hoc Reports to BIRT Designer - page 41

Revision 3 - January 2010

Format updates

Revision 2 - December 2009

Updated section on how to enable QBR Functionality for new or cloned applications beginning on page 70

Revision 1 -October 2009

(1) Included additional details on why no limitations on number of fields added to QBR Report on page 30

Initial Release - September 2009

(1) Updated User Error Message shown on page 30 for Base Services 7.1.1.5 Release (2) Added section on how QBR can be enabled for new or cloned application.

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