



**OPEN**  
SYSTEMS INC.

**Business Accounting  
and ERP Systems**  
www.osas.com

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This document describes the intended features and technology for OSAS version 8.0 as of November 1, 2013. Features and technology are subject to change and there is no guarantee that any particular feature or technology described in this presentation will be present in this or subsequent versions of OSAS.

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One of the most important features of OPEN SYSTEMS® Accounting Software (OSAS®) version 8.0 is the redesign of OSAS reporting throughout the product line. We've focused on improving the readability and usefulness of our reports, providing an easier mechanism for customizing reports by minimizing or eliminating the coding needed to make changes, and offering a wider variety of output options, including exports to popular file formats.

To satisfy our objective, we've redesigned nearly 400 reports in OSAS using new technologies. This white paper describes how we use these technologies to deliver on our promise of readability, customizability, and flexibility.

## **The Technology behind Our New Reports**

The reports in the new version are built using technologies made possible by our focus on BBJ® as our sole development platform for OSAS beginning in version 8.0. Specifically, we have developed our reports using a combination of BBJ stored procedures, SQL queries, and JasperReports®, an open-source Java® reporting tool embedded within the BBJ language.

JasperReports renders the reports based on a definition stored in a .JRXML file, an XML-formatted file which the report engine compiles at runtime to create the report. OSAS will ship with precompiled versions of these reports (for enhanced performance) in files with a .JASPER extension. The report files in OSAS version 8 are named using the same convention as the report selection screens (for example, ARPRH.Jasper for the AR Detail History Report). Many of the reports also use subreports with the report itself, which are named using the same root name followed by an underscore and an abbreviation of the subreport contents (for example, ARPRH\_KIT.Jasper for the kit detail on the AR Detail History Report).

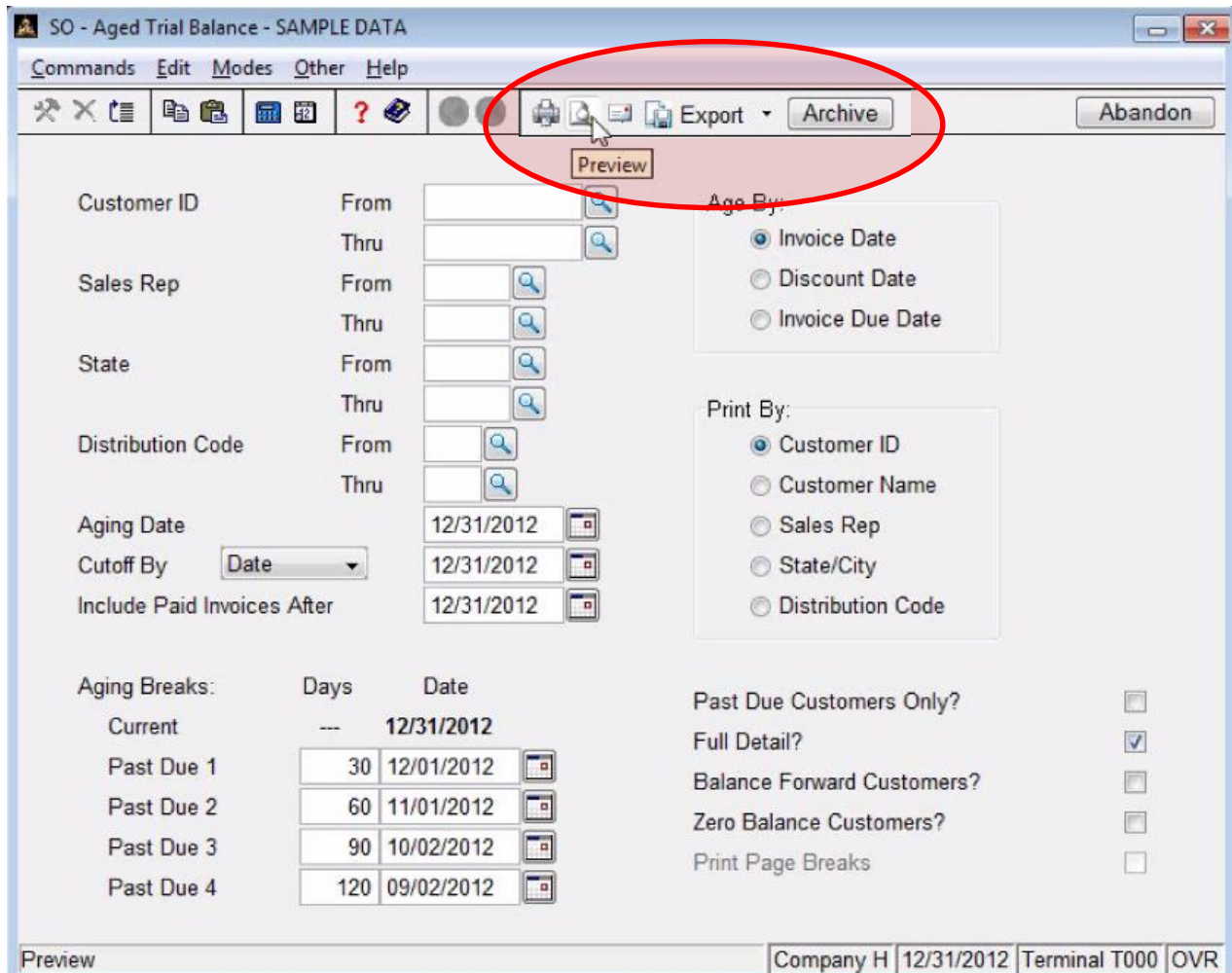
You can create or modify these definition files (in either the compiled .JASPER or uncompiled .JRXML format) using one of a handful of report design tools. At this time, OSAS Development uses iReports Designer®, a free, open-source report design tool from Jaspersoft®. The iReports Designer provides a visual, drag-and-drop, properties-based report design environment that produces the report definition files used by the reporting engine within OSAS to render the reports. The iReports Designer also includes a runtime JasperReports engine that allows you to preview the reports as you work with them. This makes it easier to create or modify reports.

JasperReports uses JDBC to retrieve data from the OSAS database. Many of the simpler OSAS reports use direct SQL queries to the OSAS database, while more complex reports access data via stored procedures that process data according to the OSAS business logic coded within them. Stored procedures are BBJ programs stored within the OSAS database, and you can customize any OSAS stored procedures, if necessary, to meet specific reporting needs. You can also call these stored procedures from any SQL query using ODBC or JDBC—even outside of JasperReports—to make OSAS business data available for other reporting or analysis needs.

The shift to using direct SQL queries and stored procedures in our report production means that the business logic that was once buried in reporting programs is now moved to the stored procedure code.

## Changes to Graphical Report Selection Screens

You'll notice some changes in the report selection (pick) screens in the OSAS version 8.0 graphical interface.



The first change is the removal of the **OK** button from the toolbar. We have replaced the **OK** button with a set of tool buttons that gives you access to your output options from within the graphical selection screen instead of from an Output screen as in prior versions (the Output window still appears in the text interface). Once you specify your report selection criteria, use these tool buttons to preview, print, or email your report directly, or to export it to a handful of the most popular export formats. You can also preview the report and then print or export it from the report viewer itself, which also provides you with an even wider array of export formats. Read the "Exporting Data" section below to learn more about the available export formats.

Another addition to the graphical selection screens is the **Archive** tool button. If you have elected to prompt for archiving for a particular report, you can select or deselect this button as necessary to archive the report or not.

Finally, each user can set a User Preference for how the navigation behaves in report selection screens. This new Preference setting controls whether a user must activate printing on graphical selection screens by clicking a tool button, or whether the **PgDn** key and/or **Enter** key at the last field are active. If you choose to make the **PgDn** key active, OSAS will use your default output preference to produce the report directly when you press **PgDn** so you don't have to click a button or use the Output screen.

## New Report Layouts

The redesigned reports in OSAS version 8.0 are created with utility and readability in mind. Headers and footers on the reports make it easy to identify the contents of the report, the date and time it was created, and the user who produced it. The new reports use sans-serif fonts, and wider reports are presented in a landscape mode to make the reports easier to read.

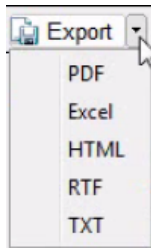
Builders Supply										Page 1 of 26
Vendor Detail History Report										
Detail by Vendor ID										
Report Criteria: Vendor ID = "All", Invoice Number = "All", Date = "All", Item ID = "All", Location ID = "All", Job ID = "All", GL Account = "All", GL Pd/Year = "All", Print For = "Base Units", Print Additional Descriptions = "NO"										
Vendor ID	Invoice Number	Invoice Date	GL Pd. / Year	Job	Cost	Loc. ID	Item ID	Units	Quantity	Ext. Cost
		P.O.	GL Account	Phase	Code	Description			Unit Cost	
VENDOR ACE001 ACE PLUMBING SUPPLY COMPANY										
ACE001	12905	07/14/2012	07 / 2012			MN0001 100		PKG	300.0000	103872.00
		14019014	104000			Electrical Package			346.2400	
ACE001	12985	07/09/2012	07 / 2012			MN0001 150		PKG	150.0000	132445.50
		14019016	104000			Plumbing Package			882.9700	
ACE001	13108	07/14/2012	07 / 2012			MN0001 400		PKG	300.0000	252249.00
		14019022	104000			Interior Materials			840.8300	
ACE001	13298	07/11/2012	07 / 2012			MN0001 460		EA	130.0000	22547.20
		14019025	104000			Slide by Window 30" X 40"			173.4400	
ACE001	13299	07/08/2012	07 / 2012			MN0001 550		PKG	40.0000	40066.80
		14019026	104000			Millwork Package			1001.6700	
ACE001	14211	09/22/2012	09 / 2012			MN0001 100		PKG	105.0000	35305.20
		14019033	104000			Electrical Package			336.2400	
ACE001	14388	10/09/2012	10 / 2012			MN0001 610		EA	10.0000	1370.20
		14019037	104000			Standard Window 30" X 40"			137.0200	
ACE001	15200	11/05/2012	11 / 2012			MN0001 100		PKG	10.0000	3407.20
		14019042	104000			Electrical Package			340.7200	
ACE001	15200	11/05/2012	11 / 2012			MN0001 150		PKG	5.0000	4372.80
		14019042	104000			Plumbing Package			874.5600	
ACE001	15200	11/05/2012	11 / 2012			MN0001 250		CS	16.0000	20771.84
		14019042	104000			Exterior Panels			1298.2400	
ACE001	15200	11/05/2012	11 / 2012			MN0001 400		PKG	10.0000	8423.70
		14019042	104000			Interior Materials			842.3700	
ACE001	15200	11/05/2012	11 / 2012			MN0001 450		EA	2.0000	314.36
		14019042	104000			Slide by Window 24" x 40"			157.1800	
04/11/2013 2:42 PM										Dave

Users can set a Preference that determines whether the header on the first page of the report will contain the report selection criteria used to generate it, making it easier to identify the information used to create the report.

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## Exporting Data

You can export any report to several different formats using the selections on the **Export** tool button.



By default, the report selection screen (or the Output screen in the text interface) will offer output directly to Portable Document Format (.PDF), Excel (.XLS), HTML, Rich Text (.RTF), or plain text (.TXT) files.

When you export to one of these formats through OSAS, you can choose to suppress the page headers and footers on each page in the resulting file. Because this option is most useful when exporting to an Excel spreadsheet, the prompt defaults to suppress the headings for Excel output.

Because the OSAS reports are designed for graphical output, exporting to a text file yields an approximation of the designed report, rendered in fixed character widths. The result can mean slight variations in the appearance of the report (for example, columns may not align precisely).

If you would like to choose another export format, you can choose to preview the report. The report viewer offers an option to save the report in an even wider array of formats, including Open Document, Comma-Separated Value, XML, and other formats.

## Other Notes about the New Reports

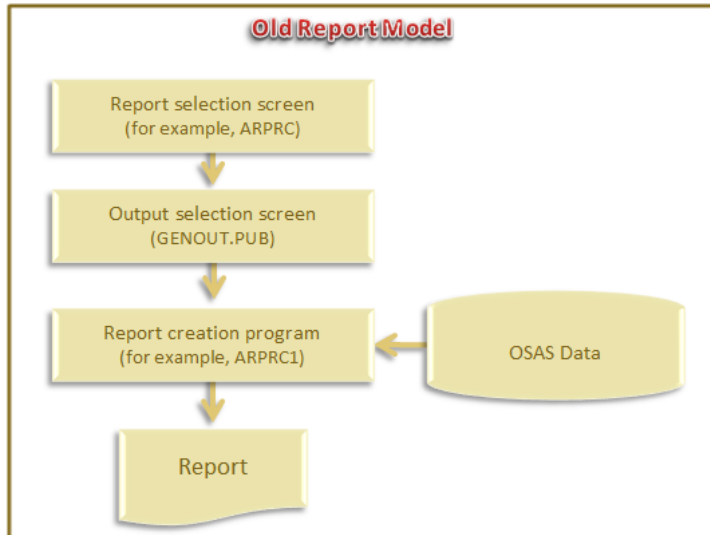
Our new reports require printers with graphical capabilities. This means that most dot-matrix printers will not be supported for report printing (although forms, such as invoices or purchase orders, will still be supported for dot-matrix printers via the direct printing methods used in prior OSAS releases).

We will also provide a new text-based report viewer in version 8.0 for non-graphical terminals. This new viewer will replace the old report-to-screen text viewer from prior versions, and will display a plain text version of the report to a character-based device. Although it is available only on non-graphical terminals, this new viewer will offer a scrolling display that includes some new features, such as the ability to skip to the end of the report, jump to a specific page number, and more.

Because the JasperReports Engine uses JDBC to retrieve the data, you should be sure to control each user's access to the data with ODBC/JDBC. You can set user access permissions for each file using the BBj Enterprise Manager. Preventing user access to certain data, such as Payroll data, assures that those users cannot print unauthorized reports outside of OSAS (by using the iReport Designer report creation tool's preview mode, for example). It also ensures restricted access to stored procedures and direct ODBC SQL queries from other applications, such as Excel.

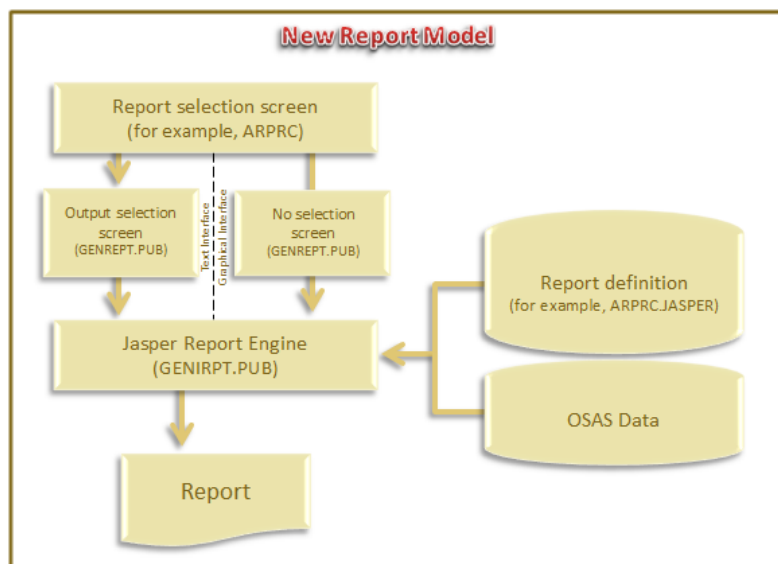
## Technical Coding Standards

Traditionally, report programs in OSAS have consisted of a report selection, or pick, screen program coupled with one or more report creation programs, named using a consistent naming format and joined by an output selection program (GENOUT.PUB), as in this program model below.



However, as mentioned above, the migration to direct SQL queries and stored procedures has done away with the need for the report creation programs. In the graphical interface, we no longer require an output selection screen (although GENREPT.PUB is called in graphical environments, no selection screen appears when you print a report).

Instead, the new model chains from the report selection screen to the GENIRPT.PUB program, which uses the Jasper Reporting object, the report definition file, and JDBC to access data and produce the report in the requested format.



Report previews on any terminal that supports graphical display are rendered using the BBJasper Preview window, regardless of the interface you use (text or graphical).

As mentioned above, in the event that a preview is requested on a non-graphical terminal, the report is produced to a text file, which is displayed on the terminal using the new text viewer program. (Keep in mind that the export to plain text creates an approximation of the report that may reveal some differences in, for example, the column alignment in the report.)

Although GENREPRT.PUB calls GENIRPT.PUB directly in report mode, GENREPT.PUB can also chain to other programs when necessary, such as in posts or periodic processing functions where logs or other reports are produced later in the program chain. In such cases, the selection screen calls GENREPT.PUB, which sets up variables used in the log creation and then chains to the next post or periodic processing program.

From a coding perspective, we have made the following changes to the programs commonly found in the pre-version-8.0 reporting model.

### **Coding Standards – Report Selection Programs**

The programs that handle the entry of report criteria (for example, ARPRC) have been changed in the following manner:

- 1.) Because the reporting engine accesses OSAS file data via JDBC connection, it is no longer necessary to open data files unless those files are needed in the report selection screen processing (for example, files that are needed by INITEM.PUB in item number from/thru fields). As such, many file open statements have been removed.
- 2.) All of the logic that would set THRU variables to high order values or that would set other variables based on selection criteria is no longer used, because it is no longer needed by the report creation programs.
- 3.) In the event that a report selection program still chains to a report creation program as in prior version of OSAS (such as is the case with certain form-printing programs), a call to GENOUT.PUB would chain to the report creation program (for example, ARSTM1) as in the past.
- 4.) For reports in the new format, the call to GENOUT.PUB is replaced with a call to GENREPT.PUB to produce the Jasper report.

### **Coding Standards – Report Creation Programs**

The programs that formerly handled the printing of reports (for example, ARPRC1), are no longer used as the queries, stored procedures, and Jasper reports control the report printing.



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**Coding Standards –Notes on GENREPT.PUB, and GENIRPT.PUB**

To produce Jasper Reports, the pick screen programs now call GENREPT.PUB, which chains to GENIRPT.PUB to produce the report.

GENREPT.PUB sets up variables for the report in a namespace area using a unique key for each report being produced. This ensures that, in the event that multiple reports are in process, each will have its own unique set of variables without interfering with one another.

For regular reports, once the variables are created, GENREPT.PUB launches GENIRPT.PUB using the SCALL verb. This is done to make the report generation an asynchronous process from OSAS, allowing users to perform other tasks while the report is generated.

In post or periodic processing program chains, GENREPT.PUB sets up the variables and then chains to the next program in the series.

GENIRPT.PUB creates a working prefix for creating the report, loads the variables in the namespace in a hash map used by the JasperReports Engine, builds the necessary connection string for this user's access to the OSAS database via JDBC, and calls the BBjJasper object to generate the report. The connection string ensures that the user's permission settings are used to control access to data in the database for the report.

**Coding Standards – Stored Procedures**

While many of the OSAS reports are defined using direct SQL queries to retrieve the data for the report, others require data filtered or computed using more complex business logic. This is done using stored procedures—BBj code embedded in the database that returns processed data for use in reporting.

Here are some notes about the stored procedures in OSAS:

- 1.) The stored procedures used by each application are included in the xxRWDATA.ZIP file on the installation media.
- 2.) A text file on the installation media named xxPROC.TXT contains specific information related to stored procedures, which is used to define the stored procedures within the data dictionary. This makes it possible to call the procedures from ODBC/JDBC SQL queries. The installation process uses this data to set up the stored procedures automatically for use by OSAS.
- 3.) The first time you launch OSAS after installation, you must also provide the admin name and password for BBj. This permits the merge program to set up the stored procedures with the proper permissions. You will also be prompted for the admin name and password the first time you start OSAS after you change the BBj admin password.

## Modifying OSAS Reports and Stored Procedures

You can modify OSAS reports and add or modify stored procedures, if necessary, to meet specific needs, just as you can modify other OSAS programs, resource files, or system files. As always, you should place any modified report definition files (\*.JASPER or \*.JRXML) or stored procedure code in the application modifications directory to ensure that your changes are not affected by maintenance updates.

### Modifying Reports

If you want to modify an OSAS report, you should follow these steps consistently:

- 1.) Set up the application modifications folder, if you do not have one already. You can set up the directory using the Application Information function on the Resource Manager System File Maintenance menu.
- 2.) Copy the Jasper report you want to modify into the modifications folder and make changes to the copy using the Jaspersoft iReport Designer. If you are creating a new report from scratch, save your report definition in the modifications folder.
- 3.) When you save your report, compile it into a .JASPER file. Save the compiled report definition in your modifications folder as well.
- 4.) Test your report by running it from OSAS. You should see your new report including any changes you have made.

### Modifying Stored Procedures

If you need to modify a stored procedure, first copy the stored procedure to your modifications folder and then make changes to it. To use the modified stored procedure instead of the original version, you must also change the source location for the stored procedure in the BBJ Enterprise Manager.

By default, OSAS stored procedures are kept in the RWdata directory. This directory is stored in a BBJ Enterprise Manager User Property called **DICTIONARY** that we use to define the source location for the stored procedure in Enterprise Manager.

If you modify a stored procedure and place it in the applications modifications directory, you will need to change the default location for the stored procedure in Enterprise Manager. You can do this by changing the source location to the full path and file name, or by using a new user property we create for you when you set up the modifications directory in Resource Manager's Application Information function.

The user property is created using a new technical feature we've added to OSAS in version 8 called dynamic user properties. This feature creates an xxMOD user property in BBJ Enterprise Manager when you enter a modification directory for an application.

You can then use the xxMOD user property to point to the location of the modified stored procedure, as in the example below.

BBj EM - APDTL

Information Source Code (Read-Only)

Name: APDTL

Description: AP - Vendor Detail List

Source Location: (DICTIONARY)APDTL.PRC

Config Location: (PROGRAM)config.bbx

Return Type: <<No Return Value>> Return Precision: 0 Return Scale: 0

Has Result Set: ☒

Parameter Specification

Name	SQL Type	Direction	Precision	Scale	Comments
VENDFROM	VARCHAR	IN	6	0	
VENDTHRU	VARCHAR	IN	6	0	
VENDLIST	VARCHAR	IN	1	0	
PRINTBY	NUMERIC	IN	1	0	
PRTSTATUS	VARCHAR	IN	1	0	
BAINST	NUMERIC	IN	1	0	
OPT_VAL1	VARCHAR	IN	1	0	
OPT_VAL2	VARCHAR	IN	1	0	
FIDESC	VARCHAR	IN	1	0	

Build Source Template Save Cancel

To change the Source Location, open the OSAS Data database, select the Procedures tab, and then select the stored procedure you have modified.

Change the value in the Source Location field using the new xxMOD user property and the procedure file name (or you can enter the complete path and file name).

In the example from the screen above, you would change the Source Location from **(DICTIONARY)APDTL.PRC** to **(APMOD)APDTL.PRC** after setting up the Accounts Payable modifications directory and then moving the modified procedure to that directory.