Business Objects™
an SAP® company

XCELSIUS 2008 GENERAL BEST PRACTICES

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INTRODUCTION

This white paper covers the general best practices for building visualizations with Xcelsius® 2008 from Business Objects, an SAP company.

Who Should Read This Guide?

Anyone who is creating visualizations with Xcelsius 2008 should read these best practices.

ABOUT XCELSIUS 2008

Xcelsius 2008 is a visualization tool for creating interactive visual models based on highly aggregated data sets. It uses a point-and-click design time environment that can easily be used by business users. No programming skills are necessary for creating Xcelsius 2008 visualizations.

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THE ROLE OF MICROSOFT EXCEL AT DESIGN TIME

We often are asked what benefits we get from using Microsoft Excel and why do we continue to use Microsoft Excel?

Apart from Microsoft Excel having a wide reach among business users and being easy to use, there are three key benefits that Microsoft Excel provides when embedded inside Xcelsius 2008:

1. A Data Model. You can enter highly aggregated data directly into the spreadsheet and visualize it, so there is no need for a database. You can also pull in highly aggregated data from external sources, including Web services, XML, and databases.

2. A Calculation Engine. In addition to Microsoft Excel having a very familiar and flexible formula language, it also provides a calculation engine.

3. An Eventing Model. When a cell changes, we get a "data change" event. This is a very simple model, but we leverage it for more than just calculations.

You can either start with a blank spreadsheet inside Xcelsius 2008 or you can import an existing spreadsheet.

If you want to export the Microsoft Excel spreadsheet out of Xcelsius 2008, on the **Data** menu, click **Export**.

THE ROLE OF ADOBE FLASH AT PREVIEW OR EXPORT TIME

When you preview or export your visualization, all of the data, logic, and formatting from the embedded Microsoft Excel spreadsheet is compiled as Adobe Flash to produce a Shockwave Flash (SWF) file

So when you distribute your Xcelsius visualization as a SWF, all the end users need in order to view the SWF is the Adobe Flash player (version 9 or later).

Note: Microsoft Excel is only required at design time when building Xcelsius visualizations.

MICROSOFT EXCEL
BEST PRACTICES

SUPPORTED MICROSOFT EXCEL FUNCTIONS

Xcelsius 2008 supports a lot of the Microsoft Excel functions. Make sure that your Excel spreadsheet uses only the Excel functions that are supported by Xcelsius 2008 – otherwise, during preview time, your visualization may not behave as expected.

To see the list of Microsoft Excel functions that Xcelsius 2008 supports:

1. From the Xcelsius 2008 **Help** menu, select **Xcelsius Help**. This opens the Xcelsius 2008 help topics.

2. In the Xcelsius 2008 help topics Contents tab, find and expand **Supported Excel Functions**.

3. To see the list of Excel functions that are supported by Xcelsius 2008, select **Supported Excel Functions**.

MICROSOFT EXCEL FUNCTIONS FOR SMALL DATA SETS ONLY

All of the Microsoft Excel functions (logic) are compiled into Adobe Flash at preview or export time.

Certain Microsoft Excel functions perform better on smaller data sets (tens of rows) when compiled as Adobe Flash, so wherever possible avoid using the following functions on larger data sets. If you must access larger data sets, have the server or database perform the aggregation on the server side.

Here is a list of the Microsoft Excel functions that you should try to avoid using unless your data is set small (tens of rows):

• SUMIF

• COUNTIF

• HLOOKUP

• VLOOKUP

USE COLORS, LABELS, AND BORDERS TO IDENTIFY DATA TYPES (INPUT AND OUTPUT)

To make it easier for you or other members of your organization to maintain Xcelsius 2008 models, it is a good idea to use colors, labels, and borders to identify cells or ranges of cells in the spreadsheet and to hint at their use.

It is often a good idea to create a legend in your spreadsheet to say what the different colors represent (input from Xcelsius, calculations in the spreadsheet, lookups, and dynamic data) – that way, you can decide on a color scheme that makes sense for your organization or team.

For example, see Table 1.

Color	Description
Bright Yellow	Input value from Xcelsius 2008
Light Green	Microsoft Excel logic (function or calculation), read-only value in Xcelsius
Dynamic Visibility	Dynamic visibility allows you to dynamic show or hide components; typically 1 means show the component and any other value means hide the component

Table 1: Sample Legend

Figure 1: Colors and Labels Used to Indicate Spreadsheet Inputs and Outputs

ORGANIZE YOUR DATA IN A LOGICAL FASHION

To make your spreadsheet easier to understand, it is a good idea to lay out your data in a logical fashion. For example, group related items together – again using colors, labels, and borders. See Figure 1.

One of the new features of Xcelsius 2008 is the embedded Microsoft Excel spreadsheet at design time. The embedded spreadsheet means you can insert or remove rows or columns, and the components track the ranges they are bound to. It is still a good practice to leave room below or to the right of your data so it can grow over time without having to add/remove rows or columns. See Figure 2.

Note: If you insert or remove rows in an external spreadsheet and import it, the components cannot track range changes.

	A	B	C	D	E	F	G	H	I	J
1										
2	Gross Sales	$ 16,581			$ 12,600	$ 13,104	$ 13,628	$ 14,395	$ 14,442	$ 14,546
3										
4	**Income Statement**				**Historic Data**					
5	**Revenues**	**FY2008**			FY2007	FY2006	FY2005	FY2004	FY2003	FY2002
6	Gross Sales	$ 16,581			$ 12,600	$ 13,104	$ 13,628	$ 14,395	$ 14,442	$ 14,546
7	Sales Return & Allowances	$ 173			$ 131	$ 137	$ 142	$ 206	$ 143	$ 162
8	Net Sales	$ 15,408			$ 12,469	$ 12,968	$ 13,486	$ 13,568	$ 15,125	$ 14,906
9	Cost of Goods Sold	$ 7,829			$ 5,949	$ 6,187	$ 6,435	$ 6,698	$ 6,656	$ 7,462
10	Gross Profit	$ 8,579			$ 6,519	$ 6,780	$ 7,051	$ 8,316	$ 7,374	$ 7,338
11	Selling Expenses	$ 3,240			$ 2,462	$ 2,561	$ 2,663	$ 2,691	$ 3,304	$ 3,976
12	General & Admin	$ 2,136			$ 1,623	$ 1,688	$ 1,756	$ 1,780	$ 3,213	$ 3,096
13	Operating Income	$ 3,203			$ 2,434	$ 2,561	$ 2,833	$ 4,301	$ 3,951	$ 3,564
14	Other income / Expenses	$ 1,365			$ 1,037	$ 1,079	$ 1,122	$ 1,322	$ 2,116	$ 1,728
15	Income Before Interest & Taxes	$ 4,568			$ 3,471	$ 3,610	$ 3,755	$ 4,402	$ 3,922	$ 5,106
16	Interest Expenses & Taxes	$ 3,224			$ 2,450	$ 2,548	$ 2,650	$ 3,782	$ 4,048	$ 3,851
17	**Net Income**	**$ 1,344**			$ 1,022	$ 1,063	$ 1,105	$ 2,127	$ 1,684	$ 1,607
18										

Figure 2: Organized Data with Lookup Row Above the Data so the Data Can Grow Downwards Over Time

PLACE FREQUENTLY USED DATA AND LOGIC AT THE TOP OF THE SHEET

Often you bind data from your spreadsheet into Xcelsius 2008 components, to make it easier to select the data you want and to minimize the amount of scrolling you have to do. It is a good idea to place frequently used or common logic or data at the top-left of the tab in your spreadsheet. See Figure 3.

	A	B	C	D	E	F	G	H	I	J	K	L	M
1													
2													
3	Selector 2	Option 1	Option 2	Option 3	Option 4								
4	Dynamic Visibility	1											
5	Department 1	$ 926	$ 773	$ 162	$ 929	$ 102	$ 311	$ 97	$ 906	$ 327	$ 768	$ 737	$ 911
6	Year To Date Values	$ 926	$ 1,699	$ 1,861	$ 2,790	$ 2,892	$ 3,203	$ 3,300	$ 4,206	$ 4,533	$ 5,301	$ 6,038	$ 6,949
7							ACTUAL						
8	Department	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
9	Department 1	$ 926	$ 773	$ 162	$ 929	$ 102	$ 311	$ 97	$ 906	$ 327	$ 768	$ 737	$ 911
10	Department 2	$ 322	$ 576	$ 36	$ 664	$ 393	$ 502	$ 57	$ 992	$ 241	$ 441	$ 992	$ 826
11	Department 3	$ 725	$ 618	$ 578	$ 850	$ 30	$ 483	$ 43	$ 817	$ 50	$ 138	$ 979	$ 85
12	Department 4	$ 825	$ 331	$ 66	$ 587	$ 98	$ 399	$ 604	$ 659	$ 480	$ 531	$ 596	$ 471
13	Department 5	$ 111	$ 11	$ 286	$ 4	$ 666	$ 358	$ 837	$ 709	$ 148	$ 104	$ 20	$ 470
14													

Figure 3: Place Common Data and Logic at the Top of the Spreadsheet

USE MULTIPLE TABS

If you find that you have to keep scrolling your spreadsheet tab to see your logic or data, you may want to consider using multiple tabs (or worksheets) instead. See Figure 4.
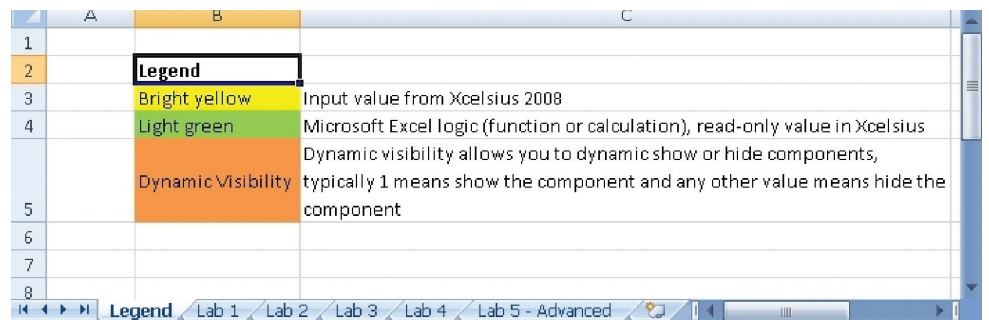

Figure 4: Using Multiple Tabs in the Spreadsheet

DESIGNING AND CREATING VISUALIZATIONS

The following are the best practices when designing and creating Xcelsius 2008 visualizations.

DESIGN ON PAPER

Remove yourself from the data you want to visualize. Create a rough drawing on paper away from your computer. This can be useful to get a general idea for the visualization you want to create and also to use to sign off the basic design of your visualization.

START WITH AN EMPTY SPREADSHEET

Xcelsius 2008 does not support using spreadsheets that have links to other spreadsheets or have macros in them. So it is a good idea to start with the empty spreadsheet that is embedded within Xcelsius 2008.

Using the empty spreadsheet will also reduce the risk that you use Microsoft Excel functions or plug-ins that Xcelsius 2008 does not support.

TRY TO KEEP THE DATA AND LOGIC TO A MINIMUM OR HARD-CODE VALUES

The more data or logic you put into your spreadsheet, the larger your generated SWF will be and the longer it will take to open.

Also, the more logic (and nested functions and cell references) you put in your spreadsheet, the longer it can take when the data changes, so the cell values (and related cells values) have to be recalculated.

If you have any data or logic that is not used within your visualization, get rid of it from your spreadsheet.

If you have functions for values that do not change (so are not dynamic or used by what-if scenarios), then to make sure your visualization is more efficient, convert the data to fixed (hard-coded) values using **Copy** and **Paste Special (as Values)** in the spreadsheet.

ADD COMPONENTS

Using the design you created on paper earlier, mock up your visualization using Xcelsius 2008 components. At this point, there is no need to add data to your spreadsheet; you are just creating the basic visual layout for your visualization. However, it is a good idea to share your design at this point as a second stage of feedback before you start adding more complexity.

ADD SOME DUMMY DATA TO TEST CHARTS AND INTERACTIVITY

Add in some dummy data to your spreadsheet – just enough so that you can test your charts and interactivity. Again, share your design to get feedback before you add more complexity.

Note: You can also copy and paste data from Microsoft Excel into the Xcelsius 2008 embedded spreadsheet.

ADD DYNAMIC VISIBILITY LOGIC

Often you want to re-use the real estate within your Xcelsius visualization by hiding and showing Xcelsius 2008 components based on user interactions or data changes.

To control when components are visible, use dynamic visibility. For example, when cell A1 has the value 1, then this component is visible; otherwise, it is hidden.

Add the dynamic visibility to your visualization so you can test the interactivity of hiding and showing components, and again, share your design to gather feedback.

REMOVE YOUR DUMMY DATA

Now it is time to replace your dummy data with actual data or data to be fed from outside of your Xcelsius model.

If the data in your Xcelsius 2008 visualization is of a secure nature, it is a good idea to remove the dummy data from your spreadsheet (but leave the cells and cell coloring as they were). Thus, before the data is retrieved and displayed, there is no data to see until the end user has successfully authenticated.

EXPORT AND TEST YOUR VISUALIZATION

Make sure you test your SWF in preview mode and also wherever you will deploy your visualization.

It is important to do this because when running outside of the Xcelsius 2008 designer, Adobe Flash has certain security restrictions – see the section "Flash Player Security" for more information.

EMBEDDING YOUR VISUALIZATION INTO A WEB PAGE

To embed your Xcelsius visualization SWF into an HTML Web page, you need to use the OBJECT and EMBED tags. The easiest way to generate the HTML for the Web page is to **Export to HTML** from within Xcelsius (which also exports the associated SWF).

There are two optional advanced topics when you export your SWF into a Web page:

1. Pass values into your Xcelsius 2008 SWF as it loads using Flash Variables:

   Use the Flash Variable connection in Xcelsius 2008 to define the Flash Variable names and where to store them in the spreadsheet when they are passed in at runtime.

   When you export your SWF as HTML, the current values for the Flash Variables from the spreadsheet are also generated in the OBJECT and EMBED tag.

   For more information on passing Flash Variables into a SWF, see http://www.permadi.com/tutorial/flashVars/.

   Note: Flash Variables are passed into Xcelsius as the SWF loads, so Flash Variable values do not trigger a data change in the spreadsheet. If you want an XML or Web service data connection, run and use those values with the **Refresh on Load** option for each connection (by the time Refresh on Load is called, the Flash Variable values have already been stored in the spreadsheet).

2. Pass values from Xcelsius 2008 out to JavaScript:

   FSCommand is a standard Flash call that Xcelsius 2008 makes available via the FSCommand connection.

   For more information on using FSCommand with JavaScript, see http://www.moock.org/webdesign/flash/fscommand/index.html.

   There are certain restrictions to Adobe Flash when you want to call out to JavaScript; see the section "Flash Player Security" for more information.

FLASH PLAYER SECURITY

Depending on how you distribute or run your SWF, the Adobe Flash player places certain security restrictions on a SWF that is running. Because Xcelsius 2008 is an application, we choose not to apply the security restrictions – so you can query data from wherever you need to at design time or preview time in Xcelsius 2008.

If you export your Xcelsius visualization to Adobe Acrobat, then that also does not apply any security restrictions on your SWF.

If you export your SWF in any other way, read on for some other restrictions. Because of the security restrictions, you may see runtime errors when you run your SWF. Refer to the list of Adobe runtime errors at http://livedocs.adobe.com/flex/2/langref/runtimeErrors.html.

RUNNING A SWF FROM YOUR DESKTOP – MAKE THE SWF TRUSTED

If you export to Microsoft PowerPoint, Microsoft Word, HTML, or to your desktop to run the SWF, you may find the SWF does not work if you try to retrieve data or try to navigate to a Web page because of the Adobe Flash security restrictions.

To run this SWF on your desktop, you need to make it trusted, so it can access Web sites or local data.

Note: You can make a SWF trusted using the Global Settings Manager (if you have Internet access) or with a FlashPlayerTrust configuration file.

To make a SWF trusted using the Global Settings Manager:

1. Run the SWF.

2. Right-click on the SWF to see a context menu and select **Settings…**

3. Select the **Privacy** tab.

4. Click **Advanced**… (opens in a new window).

5. Select **Global Security Settings Panel** (in the Table of Contents).

6. Add this SWF as trusted location.

7. Close the browser and reload the SWF.

RUNNING A SWF HOSTED ON A WEB SERVER –
USE A CROSS-DOMAIN POLICY FILE

If you host your SWF on a Web server, make sure that any Web server you need to connect to for live data has a cross-domain policy file in the Web server root (the location of the root folder differs for each Web server). If you do not, then you may not be able to connect to the Web server to get data when you run the SWF hosted on your Web server.

The cross-domain policy file controls which SWFs running in which domains can access your Web server.

Figure 5 presents an example of a cross-domain policy file that lets any SWF running on any domain access your Web server. This file needs to be placed on the root of your Web server.

```xml
<?xml version="1.0"?>
<!DOCTYPE cross-domain-policy SYSTEM
"http://www.macromedia.com/xml/dtds/cross-domain-
policy.dtd">
<cross-domain-policy>
    <allow-http-request-headers-from domain="*"
headers="*" secure="false" />
    <allow-access-from domain="*" secure="false" />
</cross-domain-policy>
```

Figure 5: Sample Cross-Domain Policy File

Note: The `<allow-http-request-headers-from … />` line in Figure 5 is a new cross-domain policy requirement for Flash Player 9 onwards.

FURTHER READING

For more information on Xcelsius 2008, including best practices, forums, and white papers, refer to the following Web sites.

Xcelsius 2008
http://www.businessobjects.com/product/catalog/xcelsius/

Xcelsius 2008 on Diamond
https://boc.sdn.sap.com/xcelsius

Xcelsius 2008 Component SDK on Diamond
https://boc.sdn.sap.com/xcelsius/sdk

Other useful sources of information for Xcelsius 2008 on the Web:

Interactive Data Visualization blog by Ryan Goodman
http://ryangoodman.net/blog/

The Xcelsius Journal
http://www.xcelsiusjournal.com/

DataPig Technologies Xcelsius Tips and Tricks (Crystal Xcelsius 4.5)
http://www.datapigtechnologies.com/XcelsiusMain.htm

ABOUT BUSINESS OBJECTS,
AN SAP COMPANY

As an independent business unit within SAP, Business Objects transforms the way the world works by connecting people, information, and businesses. Together with one of the industry's strongest and most diverse partner networks, the company delivers business performance optimization to customers worldwide across all major industries, including financial services, retail, consumer-packaged goods, healthcare, and public sector. With open, heterogeneous applications in the areas of governance, risk, and compliance; enterprise performance management; and business intelligence; and through global consulting and education services, Business Objects enables organizations of all sizes around the globe to close the loop between business strategy and execution.

Business Objects has dual headquarters in San Jose, Calif., and Paris, France. The company's stock is traded on both the Nasdaq (BOBJ) and Euronext Paris (ISIN: FR0004026250 - BOB) stock exchanges. More information about Business Objects can be found at www.businessobjects.com.

Notes

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