

Oracle Essbase - Not just for Financial Analytics

Executive Summary

Oracle Essbase is not just for financial analytics anymore. By expanding its use beyond the Finance department, you will begin to see the true value of this flexible and functional tool.

This white paper will show how you can use an existing sales analysis cube as a foundation for an inventory analysis cube.

Reusing existing meta-data such as the product hierarchy between cubes can really speed up the development process and is a best practice of Essbase design. Additional examples featured in this white paper include using this new inventory cube to answer some real-world business questions.

The goal is to make Essbase relevant to your entire organization so it can improve your daily operations.

Not Just for Financial Analytics Anymore

People sometimes think of Oracle Essbase as only suited for the Finance department. While it's true that Essbase "excels" at this, the tool can help almost any business function that uses numeric data. Its ability to analyze in a multidimensional fashion allows users to "slice and dice" numbers to gain new insight into what's happening in their business.

Once you see how to do this in one area, why not use the same techniques somewhere else?

The goal is to increase the value of Essbase in your organization by using it in ways you might not have previously considered. Move it beyond the Finance Department and make yourself an analytics superstar!

Here are a few areas where savvy users of Oracle Essbase can extend it horizontally across multiple business functions:

- ◆ Operations: inventory control, forecast accuracy analysis
- ◆ Sales & Marketing: product profitability, spend planning
- ◆ HR: compensation trend analysis, timesheet tracking
- ◆ Manufacturing: build plans, bill of material analysis
- ◆ Finance: days sales outstanding (DSO) analysis

This white paper will describe how Oracle Essbase can be used for detail level inventory analysis for a fictional Operations department. It utilizes a variation of the "Sample Basic" cube that ships with Oracle Essbase. Along the way, we'll review some best-practice design tips. The intent is to show how you can leverage an existing, known cube structure and build a new application using this knowledge.

Detail Level Inventory Analysis

Background: TBC (The Beverage Company) makes and distributes beverages. A large part of their capital is tied up in the bottles of various drinks that are sitting in their warehouse and on vendor's shelves.

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They want to limit the amount of money spent on manufacturing their products and not spend money making beverages that customers are not buying. This will free up cash to be used for other business purposes such as advertising, product research and investing. TBC thinks one way to achieve these goals is to better manage their warehouse inventories.

Scenario: TBC has been using their Essbase cube “Sample Basic” to track product profitability (Profit, Sales, COGS and Operating Expenses) and some important inventory data (Opening and Ending Inventory Balances). This allows users to answer questions such as “What are the ending inventory balances by Product by Month?” However, it does not go down to a low enough level of detail for TBC’s required reports (ie daily inventory analysis by warehouse).

Question: How can TBC build another Essbase application that will provide more detailed analysis of their daily inventory warehouse operations?

Let’s start by reviewing the existing Sample Basic cube structure: (Figure 1)

◆ It’s evident that the existing Sample Basic cube would need some changes to meet the requirements.

- ◆ The “Year” must go to the day level
- ◆ The “Market” dimension does not apply
- ◆ A “Warehouse” dimension is needed

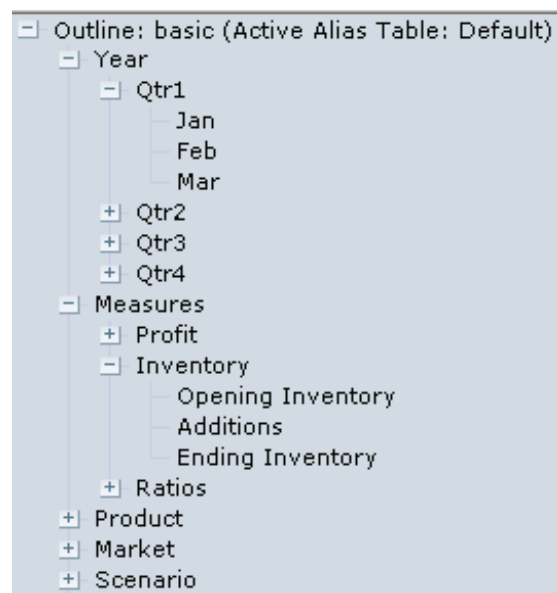


Figure 1

- ◆ The lowest level of data currently available for the “Year” dimension is “Month” (ie Jan, Feb, Mar, etc). However, TBC needs it at the day level.
- ◆ Many of the existing dimensions can still be used (Year, Measures, Product, Scenario) but “Market” is not needed.

Solution: This requirement can be addressed by creating a new “Inventory” cube based on the existing “Sample Basic” cube. It will share dimensions and attributes where possible and have new dimensions and attributes where necessary.

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Step 1 - Make a copy of the “Sample Basic” application within Essbase Administration Services (EAS). To do this, right-click on application name “sample” and select “Copy...” Name this new application “Inventory” (we’re limited to 8 characters in naming) and press “OK”. (Figure 2)

This will create a new application/database “Inventory Basic” which contains all components of the “Sample Basic” application.

Product, Market, Scenario” will become “Years, Measures, Product, Warehouse, Scenario”.

The only dimension name change will be renaming and updating “Market” to “Warehouse”. Having dimensions use identical names between cubes also helps with user acceptance training. Learn the function of one cube and the other cubes are similar. (Figure 3)

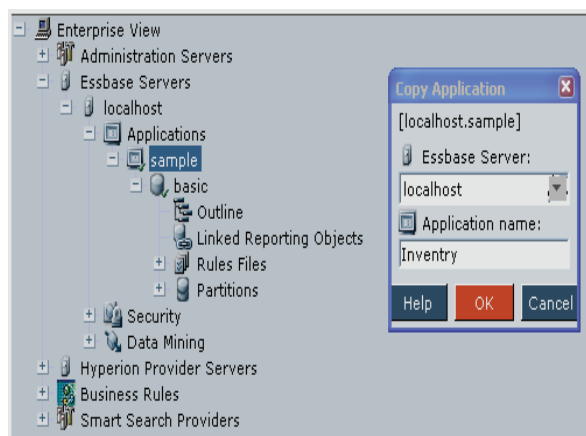


Figure 2

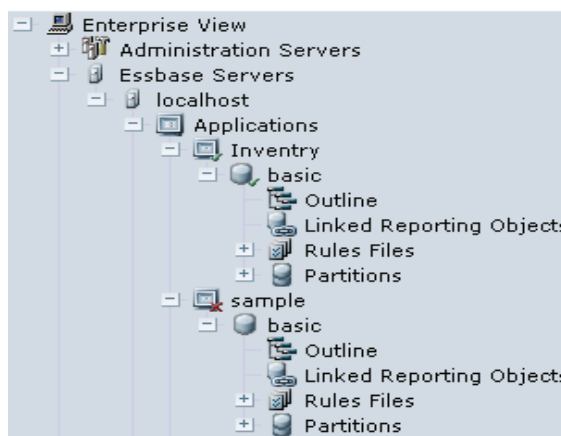


Figure 3

The advantage of copying an existing cube (if available) instead of starting from scratch is that several of the dimensions (such as “Product”) are common between both applications. Reusing all the hard work previously done saves time, money and cuts down on errors. You can also use the same dimension build rules in many cases.

After our changes, dimensions “Years, Measures,

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Step 2 - Update “Year” dimension to include specific date/time members. The “Year” dimension in “Sample Basic” only goes to the month level. Our requirement is to go to the day level. No problem... simply add dates as children of the month member. (Figure 4)

Our example will use the first seven days of calendar year 2009 to demonstrate the idea. I recommend you add a text prefix of “d” (for “date”) to the member name so that Excel interprets this as a text value and not a numeric value. For example, list “20090101” (Jan 1,

To keep things simple, just change the member names to reflect your needs. Delete the member names under East, West, South, and Central (such as New York, Massachusetts, etc) and then add the prefix “Warehouse” to East, West, South and Central.

You do not want to use the same member names East, West, South, and Central in different cubes if they have different meanings.

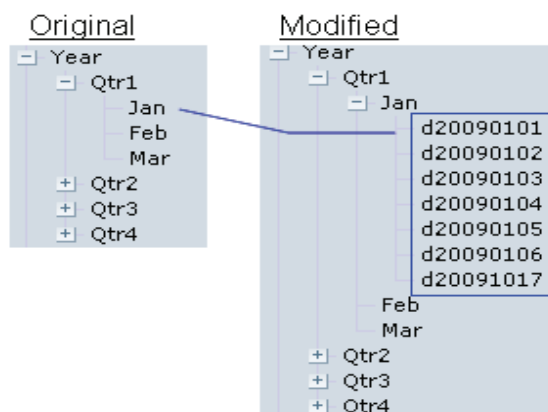


Figure 4

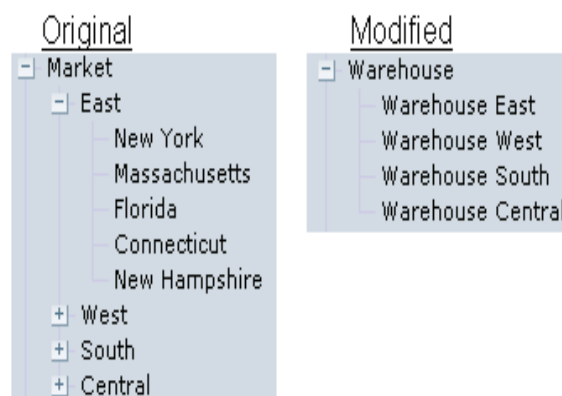


Figure 5

2009) with the “d” prefix to designate it as a date. This is not a requirement of Essbase, just a helpful suggestion. Correct choices while creating the Essbase outline can help users later on.

Step 3 - Change “Market” to “Warehouse” and update contents. As previously stated, TBC does not want the “Market” dimension in this cube and needs a “Warehouse” dimension instead. (Figure 5)

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Keeping unique member names across your cubes is a best-practice of Oracle Essbase outline design. This reduces confusion for users over the meaning of member names and helps your company gradually define a common data dictionary of business terms. For instance, don't use the term "East" in one cube to define a "Market" and "Warehouse" in another cube. It confuses users and leads to incorrect data retrievals or misinterpretation. (Figure 6)

Likewise, keep identical names in dimensions if they reference identical things. Notice how the "Product" dimension is the same in both outlines. (Figure 7)

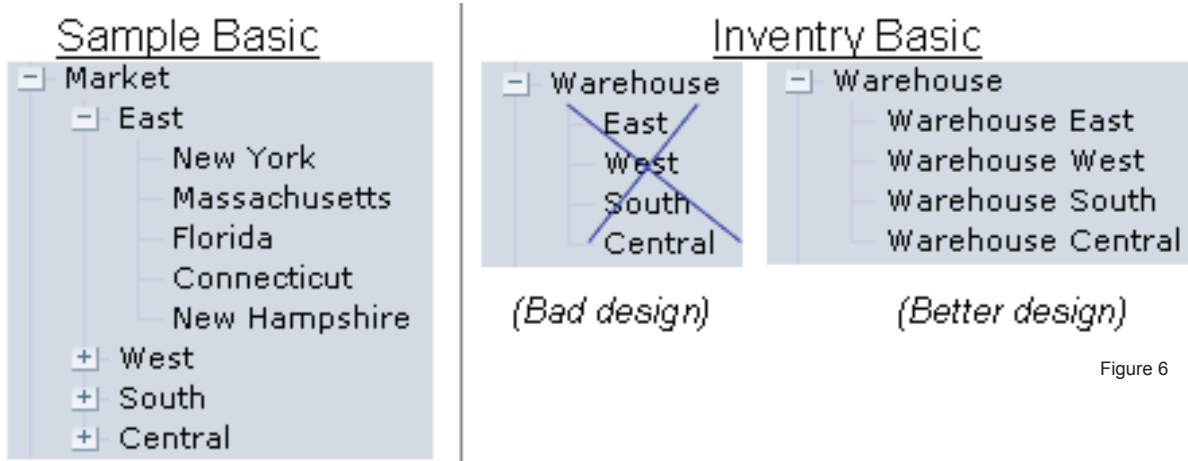


Figure 6

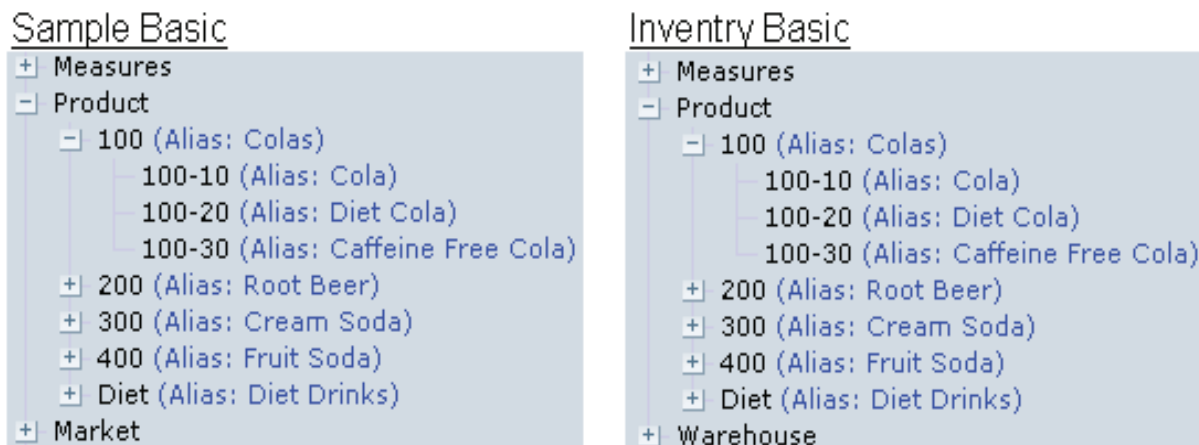


Figure 7

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Step 4 - Update the “Measures” dimension. Let’s delete the “Profit” and “Ratios” members and replace the “Inventory” members as shown. We want to look at “Units” and the valuation of those units, called “Value”. (Figure 8)

As a side note, inventory is valued at the cost to the company to produce the products. So if you only have inventory “cost” available in your data source, it should be the same thing as the inventory “valuation” in our example application.

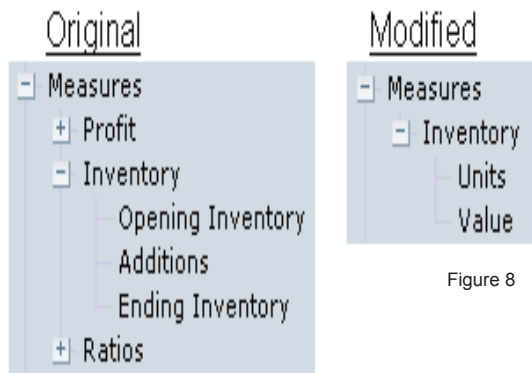


Figure 8

Ask IT to extract a tab delimited text file containing data with the following fields: (Figure 9)

- ◆ Date
- ◆ Product
- ◆ Warehouse
- ◆ Actual
- ◆ Inventory Units
- ◆ Inventory

You will need to create a load rule to get the data into

Date	Product	Warehouse	Actual	Inv Units	Inv Value
d20090101	100-10	Warehouse East	Actual	10,000	12,000
d20090101	100-20	Warehouse East	Actual	5,000	6,000
d20090102	100-10	Warehouse West	Actual	8,000	9,000
d20090102	100-20	Warehouse South	Actual	6,000	7,000

Figure 9

Step 5 - Load data. You may be asking yourself “Just where am I going to get data to support this cube?” Good question. I suggest asking your friendly neighborhood IT department for this file. All companies using Oracle Essbase have some sort of computer based inventory management system.

Essbase. A best practice is to have your data “clean” before it gets to the load rule. This means including the correct member names so no further manipulation (such as fixing member names) is needed within the load rule. This is not a requirement, just a good idea.

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Data Analysis Examples:

Our database can be further improved by adding aliases to member names ("All Products" and "All Warehouses") and aliases to date members (where "d20090101" becomes "Jan 01, 2009"). These types of things improve the overall user experience and remove the guess work of figuring out what things mean.

A sample of the completed database outline is shown here. Notice the Sample Basic cube contained several

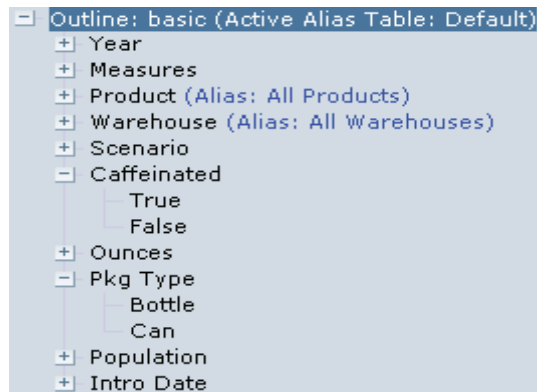


Figure 10

product attributes which were carried over to our Inventory Basic cube (Caffeinated, Ounces, Pkg Type, Population, Intro Date). Attributes function the same way as dimensions and we can make good use of them. (Figure 10)

Now that the cube has been defined and data loaded, lets look at using it for detailed daily inventory analysis. Start with a simple examination of inventory units and valuation for all products by day for the first

seven days of 2009. Notice how inventory units and values are building rapidly that first week. This may be according to plan or a warning flag that TBC is building too much product. In either case, ready access to the numbers provides a way for managers to understand and take appropriate action.

Earlier we asked how TBC can better manage their warehouse inventories to drive efficiencies throughout the company. How can this inventory cube help? Let's

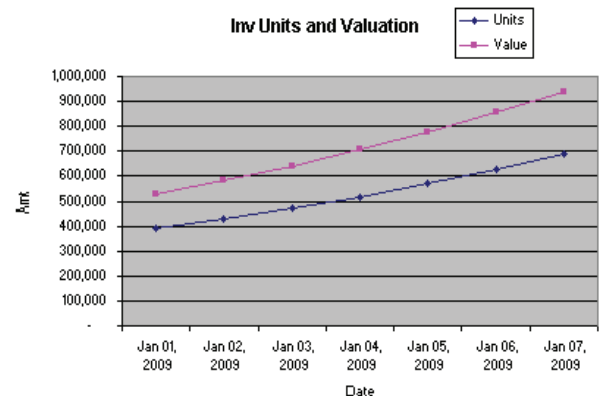


Figure 11

look at sales in the East region, and see if TBC is creating the right beverages to meet demand. Use the "Sample Basic" application to analyze actual sales by product.

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The most popular products in the East region during June were Colas. The least popular were Fruit Sodas. TBC also knows from historic trends that July sales numbers tend to replicate June sales. How can TBC use this information to make a sound business decision on how many bottles to produce for July? (Figure 12)

this to actual sales trends.

Here is a sample inventory level retrieval for the last 4 days of June for the East warehouse by major product group. (Figure 13)

Using their new "Inventory Basic" cube, TBC can see how much product has been filtering into the East warehouse during the last days of June and compare

	Sales New York	Actual Massachusetts	Jun Florida	Connecticut	New Hampshire	East
Colas	8,940	6,518	5,867	3,378	3,037	27,740
Root Beer	7,939	5,180	5,283	3,090	2,180	23,672
Cream Soda	9,305	1,418	4,704	3,849	965	20,241
Fruit Soda	8,514	1,541	2,487	2,094	1,109	15,745
	34,698	14,657	18,341	12,411	7,291	87,398

Figure 12

	Actual June 27, 2009	Warehouse East June 28, 2009	Inventory June 29, 2009	June 30, 2009
Colas	89,792	98,771	108,648	119,513
Root Beer	22,448	24,693	27,162	29,878
Cream Soda	16,836	18,520	20,372	22,409
Fruit Soda	8,418	9,260	10,186	11,204

Figure 13

This leads to some observations:

♦ TBC may be producing too many Colas in the East compared to anticipated demand. Cola sales in June were approx 28,000 bottles yet they have approx 120,000 bottles available in the East warehouse at June 30. That means there is 4 times as much supply as there is demand. The ability to see several days of ending inventory shows that Cola inventory levels are

trending upward. This seems like a problem. Perhaps some Cola bottles could be shipped to other warehouses if they're running low. TBC should notify the factory that they can produce less bottles of Cola for the next few months. This should save some money and free up capital for other uses. Management should look at similar trends in other regions.

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- ♦ Cola numbers could also be signaling that user demand for this product is weakening and inventory needs to be adjusted downward. TBC should do more detailed sales trends analysis using the “Sample Basic” cube. There may also be a solid business reason for building excess Colas, such as an anticipated spike in sales due to a new advertising campaign.
- ♦ Root Beer, Cream Soda and Fruit Soda appear to be trending correctly for July. There is a balance between

Here is an example of “Units by Warehouse by Caffeinated (True / False) by Package Type (Can / Bottle) by All Products by specific date”. (Figure 14)

Seems like a lot of detail, but this is precisely what many companies need but struggle to achieve. Without Essbase, collecting data, putting it into a usable format, and creating this type of report can take many hours. With Essbase, the overall process is greatly simplified, saving time while greatly extending the types of analysis that can be achieved.

	Units Actual Jan 01, 2009 Caffeinated_True Can	All Products Actual Jan 01, 2009 Caffeinated_False Bottle
Warehouse East	29,487	37,975
Warehouse West	36,859	47,469
Warehouse South	46,074	59,336
Warehouse Central	57,592	74,170
All Warehouses	170,012	218,950

Figure 14

	Units Actual Jan 01, 2009 Caffeinated_True Can	All Products Actual Jan 07, 2009 Caffeinated_True Can	Variance
Warehouse East	29,487	52,238	22,751
Warehouse West	36,859	65,298	28,439
Warehouse South	46,074	81,622	35,549
Warehouse Central	57,592	102,028	44,436
All Warehouses	170,012	301,187	131,175

Figure 15

supply and anticipated demand for the East.

There are many other analysis possibilities but this gives one solid example. Having the data readily available allows for thoughtful business questions that can drive informed business decisions.

Another use of this cube is for daily detailed inventory reconciliations. Let's introduce the use of product attributes into our reporting.

Here is a variation on the previous report. It focuses on “canned” beverages and looks at the warehouse unit variance between two dates. The basic query remains the same but the ability to quickly refilter the data using Essbase retrievals and member selection is terrific. It illustrates the value-add that Essbase brings to an organization. The speed of thought analytics for one version of the truth is a real winner. (Figure 15)

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