Learning About SAP Business Warehouse (BW) for Financials at Duke

An Analytical Tool for SAP Financial Users at Duke
Outline of Chapters

- **Chapter 1: Introduction to Business Warehouse (BW)**
  - What is BW and how does it work?
  - Who will benefit from BW versus R3?

- **Chapter 2: Getting Started with BW**
  - What are the terms and definitions used in BW, like query and InfoProvider?
  - How do I gain access and log into BW?
  - What are some basic navigation tools?

- **Chapter 3: The Basics of Working with Existing Queries**
  - How do I open an existing query?
  - How do I navigate and change the query results, like formatting or filtering the data?
Outline of Chapters (continued)

- Chapter 4: Existing Queries by Organizational Unit
  - How do I select and view queries by Organizational Unit (BFR Code - 0010 or Cost Center/Profit Center Group – Health System)?

- Chapter 5: Saving and Using Workbooks
  - What is a workbook?
  - How do I use this tool to save one or more queries?
  - How do I open existing queries in a workbook?
  - How do I insert more queries in a workbook?

- Chapter 6: Summary of Business Warehouse (BW)
  - What is a summary of all the content I’ve learned about BW?
Chapter 1:
Introduction to Business Warehouse (BW)
What is Business Warehouse (BW)?

- **BW** = **Business** intelligence **W**arehouse (also known as a data warehouse of information)

- **Decision Support** software developed by SAP as a tool to optimize analysis of data
  - SAP BW is **OLAP** software - **On Line** **Analytical Processing**
  - As opposed to SAP R/3 which is **OLTP** software - **On Line** **Transaction Processing** (Real-time Production and Basic Reporting)
How does BW work?

- Collects information from a variety of sources (R3, etc.) in a data warehouse
- Stores information in an elaborate set of tables within the data warehouse
- Allows users to query, format, and analyze data from those tables in one or more Excel worksheets
  - Primarily accessed through an **Excel add-in**, called **Business Explorer (BEx)**
  - Faculty can access via web
Who will use BW for Financials?

- **Occasional Users**: use Web for custom reports (example: Faculty)
- **Frequent Users**: use BEx for existing queries (example: Business Managers)
- **Power Users**: use BEx for advanced queries (example: Management Centers)

- Occasional Users: 75%
- Frequent Users: 20%
- Power Users: 5%
Why use SAP BW versus SAP R/3 for data analysis?

- R/3 is a production system
  - Designed to process transactions (OLTP)
  - Provides reporting with limited options
  - Reporting impacts R/3 performance for processing transactions

- BW is designed for analysis and reporting
  - Allows more flexibility in analyzing data (OLAP)
  - Enables users to create more custom reports and to spin the data in different ways
Chapter 2: Getting Started with BW
# BW Terms and Definitions

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>InfoCube</td>
<td>A <strong>table</strong> which collects and stores <strong>characteristics</strong> (attributes) and <strong>key figures</strong> (dollars) in BW – Example of InfoCube for financials = G/L Account Balances</td>
</tr>
<tr>
<td>ODS</td>
<td>Operational <strong>Data Storage</strong> – a <strong>table</strong> that contains <strong>transaction data</strong> stored at the <strong>document level</strong>.</td>
</tr>
<tr>
<td>InfoProvider</td>
<td><strong>InfoCubes</strong> (balances) or <strong>ODS</strong> (transactions)</td>
</tr>
<tr>
<td>Query</td>
<td>An <strong>evaluation of data</strong> per the selection of attributes and dollars from <strong>InfoCubes</strong> that can be analyzed in an Excel worksheet – users can define and customize queries based on how they want to view and navigate data.</td>
</tr>
<tr>
<td>Workbook</td>
<td><strong>Collection of Excel spreadsheets with embedded queries</strong> composed of one or more related worksheets</td>
</tr>
<tr>
<td>InfoArea</td>
<td>Comprised of <strong>folders of InfoProviders</strong> that contain existing queries and workbooks.</td>
</tr>
</tbody>
</table>
To Gain Access to BW via the Business Explorer (BEx):

These steps pertain to anyone except Faculty. Faculty may access BW via the web and instructions are included on the website listed below.

- Request access to Business Warehouse via your departmental R/3 User Administrator
- Download instructions* from the website listed below to:
  - Add BWP to your SAP Logon 620 window and
  - Load Business Explorer to your desktop

*Instructions for above are available at:

http://www.r3.duke.edu
To Log Into BW:

- Ensure Excel is not active
- Use the Authentic Login to obtain your ticket
- Double click on the SAP logon icon
- In the SAP Logon 620 window, double click on BWP

MAC users should log into SAP per the usual steps, then select and open BWP on the Open: SAPGUI screen.
On the SAP Easy Access screen in BW, to open the BEx (Excel add-in):

- Enter the transaction code **RRMX** in the Command field.
- Click on the **Enter** button.
The transaction code RRMX does the following:

- Opens a BEx Excel session
- Inserts a SAP Business Explorer toolbar

From the Excel session, the toolbar allows you to open and select InfoProviders to run the queries and/or workbooks.
The Business Explorer toolbar contains buttons to help analyze data.

- **Open**
- **Save**
- **Refresh query**
- **Back**
- **Change query**
- **Goto**
- **OLAP functions for active cell**
- **Tools**
- **Layout**
- **Format**
- **Settings**
- **Help**
For example, to open and review Duke’s InfoProviders for financials:

Reminder: InfoProvider = Infocubes (tables of balances) or ODS (transactions)

- Click on the **Open** button.
- Select **Queries** from the list.
- In the **SAP Bex: Select query** box, click on **InfoAreas**
- To view the **InfoProviders** on the right, expand **InfoArea folders**
  - **Financials Management & Controlling**
  - **Duke Custom Financial Objects**
The InfoProvider financial objects are identified as follows:

Primary objects = InfoCubes
- For financial analysis, cubes represent balances

Secondary objects = Operational Data Store (ODS)
- transactions

Multi-cubes = combination of two or more InfoCubes and ODS
- Example: balances and transactions

Most of your analysis will be focused on InfoCubes
More about InfoProviders:

- Each **InfoProvider** contains **Queries**
- The **keyboard symbol** identifies a **Query**
- The Queries are categorized into **InfoProviders** by module or area of the system (see next pages)
Summary of InfoProviders:

<table>
<thead>
<tr>
<th>Category</th>
<th>Pertains to:</th>
<th>Contains:</th>
<th>Data that can be viewed using the related queries:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controlling (CO)</td>
<td>All Company Codes</td>
<td>Cost centers, Profit centers, Projects/ WBS Elements, and Internal Orders</td>
<td>- Costs and Allocations – Balances, e.g., Plan vs. Actual (Mo. and YTD) by Duke Org hierarchy level</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- CO Only Transactions</td>
</tr>
<tr>
<td>Profit Center Accounting (PCA)</td>
<td>All Company Codes; limited use for 0010</td>
<td>Revenue, expenses, and some limited liabilities</td>
<td>- PCA: Balances, e.g., P&amp;L by department for each DUHS company code</td>
</tr>
<tr>
<td>Funds Management (FM)</td>
<td>0010 and 0023 only</td>
<td>Balances for funds, fund groups, class, category, etc. reporting</td>
<td>- Commitments, Actuals, and Budget in FM, e.g., Fund Trial Balance by Hierarchy</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Historical Funds Management Data from DAFT (no hierarchy)</td>
</tr>
</tbody>
</table>

Table continued on next page.
Summary of InfoProviders:

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<th>Contains:</th>
<th>Data that can be viewed using the related queries:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Systems (PS)</td>
<td>All Company Codes</td>
<td>Projects/WBS Elements and Internal Orders (3xx and 7xx cost objects in Company Code 0010)</td>
<td>- Project Systems – Balances, e.g., ITD plan vs. actual for Federal grants by BFR&lt;br&gt;- Project System – Dates&lt;br&gt;- Project System – Controlling/Dates Multi-cube</td>
</tr>
<tr>
<td>Financial Accounting (FI)</td>
<td>All Company Codes</td>
<td>G/L Account Balances only; no Cost Objects</td>
<td>- General Ledger – Balances, e.g., Balance Sheet (entire company)&lt;br&gt;- FI/GL Transactions with Vendor Spend Extensions ODS (also used for materials management)</td>
</tr>
<tr>
<td>Combined CO and PCA</td>
<td>All Company Codes</td>
<td>Data for all Cost Objects; Uses <strong>custom defined objects and associated hierarchies</strong> → Duke Cost Object or <strong>CODUKEORG</strong></td>
<td>- CO Costs/Allocations &amp; PCA Transaction Data&lt;br&gt;- Plan vs. actual analysis of all three Cost objects for department – Profit Centers, Cost Centers and Projects</td>
</tr>
</tbody>
</table>
More About Duke Cost Object (CODUKEORG) in BW:

- Combines all four major objects in one place for reporting - Cost Centers, Profit Centers, Projects/WBS Elements, and Internal Orders
- Places all cost objects on one super hierarchy
- Enables consolidated view of entire organization’s financial activity
- Uses different format for Duke Cost Objects
  - Format examples: KSDUKE0001573170 for a cost center or PD0012345 for a Project / WBS Element
  - Fortunately, new format is accompanied by Familiar Name, like 1573170 or 3039876
Chapter 3:
The Basics of Working with Existing Queries
Tip - to easily move between windows or applications while using BEx:

- The BEx tool can appear to “lock up” in windows as you’re trying to minimize or maximize windows.

- Use the **Alt + Tab** keys together to view open windows and move between applications:
  - Depress **Alt** key with thumb and hold
  - Use another finger to click on the **Tab** key and scroll through the open windows.
  - Release both keys at once to select and go to a window.
To open an existing query (example - a simple list of cost centers):

- Select and expand InfoAreas
  - Financials Management & Controlling
  - Duke Custom Financial Objects

- Select and expand InfoProvider
  - CO-OM: Costs & Allocations (Duke)

- Click once on the Query and click the OK button.
  - Cost Ctr, Range, Plan vs. Actual

6/10/2005
To execute a query (example – a simple list of cost centers):

In the selection dialog box -

- Enter the desired fiscal period in the **Fiscal Month/Year** field (Example: **02/2005** for August, 2004)
- Enter the desired cost center(s) in the **COST CENTER (Selection)** field (Example: 1573123 to 1573146)
- Click on the **Execute** button

The query results show in the BEx analyzer in Excel.
To navigate the data, choose one of these methods:

- Use the **Business Explorer menu path** (at top)
- Use the **Business Explorer toolbar**
  - OLAP functions for active cell button (same as right mouse click)
  - Back button
- Within an active cell, **right click** on mouse
With any of the methods, a drop-down menu will allow you to do things like:

- Sort Cost Centers in ascending or descending order
- Display Cost Centers with Key only (hide Cost Center name)
- Swap or switch results from Cost Center to Cost Element
- Use **Back** button (BEx toolbar) to return to Cost Center
- Drill-down from Cost Center to view Cost Element detail
- Use **Back** button (BEx toolbar) to return to Cost Center
- Filter for Cost Element, Supplies & Materials

The steps for the examples above are covered in the next pages of this chapter.
For example, to sort a column in ascending or descending order:

- In the Results area, **right click** on a column heading (Example: Cost Center)
- Click on **Sort**
- Click on the desired sort option, for example -
  - Descending According to Key (Cost Ctr. number)
  - Ascending According to Name

If preferred, click on the column heading and either click on the **OLAP functions**... button OR the **Business Explorer** menu for the same drop-down of options.
To display cost centers by key/number only (hides the cost center name):

- In the Results area, right click on the Cost Center column heading (use other methods if desired)
- Click on Display as
- Click on the desired option, such as Key (number) which hides the cost center name

The Cost Center Name disappears in example to left.
To swap from a Cost Center view to Cost Element view of the results:

- In the Results area, **right click on the Cost Center column heading** (use other methods if desired)
- Click on **Swap Cost Center with**
- Click on the **Cost Element** (or other options listed)
- Use the **Back** button on the BEx toolbar to return to Cost Center view

The data “swaps” from a cost center view to a cost element view for the cost centers selected.
To drill-down on one cost center and view cost element detail:

- In the Results area, **right click** on the cell desired - **Cost Center** column heading or an individual cost center (use other methods if desired)
- Click on **Add Drilldown According to**
- Click on **Cost Element**
- Use the **Back** button on the BEx toolbar to return to Cost Center view

The results expand to show Cost Element data for each Cost Center selected.
To filter the results, for example to show only certain Cost Elements:

- In the top left of the report, right click in the field beside Cost Element (use other methods if desired)
- Click on Select Filter Value…

Steps continued on next page.
To filter the results, in the Selection for Cost Element dialog box (continued):

- Use one of these options to filter -
  - Enter a **Cost Element range** in the **Selection** panel using semi-colon to separate lower and upper limit of range (Example: 640000;649999)
  - OR highlight **Cost Element groups** in **Fixed Value** panel and use the **Add** button to add to Selection panel (use **CTRL** key to select more than one)

- Click on the **OK** button to return to a filtered report showing only the cost elements selected.
A formatted or filtered query can be saved for use at a later date.

- A query is saved into a **Workbook** (collection of Excel spreadsheets with embedded queries)
- Other queries can also be **inserted and saved** into the same Workbook to help with comparing and analyzing data
- Saving and inserting queries into Workbooks are covered in **Chapter 5**.
Chapter 4: Existing Queries by Organizational Unit
There are two ways to run an existing query by Organizational Unit.

Reminder: Organizational Unit = BFR Code for 0010 & Cost Center / Profit Center Group for Health System

- Execute a query that selects and displays a list of cost centers, then allows you to filter the results by the Organizational Unit.
- Execute a query that selects and displays by hierarchy per the Duke Cost Object (CODUKEORG) based on your security authorization.
To use a query that selects a list of cost centers:

- Follow same steps in Chapter 3 to run a query to list cost centers.
- Expand **InfoArea & InfoProviders** and select query (Example: **Cost Ctr. Plan vs. Actual, Selection by Hierarchy**).
- In the dialog box -
  - Enter **Period/Fiscal Year**
  - Select a broader range of **Cost Centers**
- Click on the **Execute** button.
Filter the results to view only a certain Organizational Unit.

- Follow steps in Chapter 3 to select a filter
- Right click in field beside **Duke Cost Object** (use other methods like toolbar if desired)
- Click on **Select Filter Value**...
- Open the **Organizational Units** on Fixed Values panel
- **Select and add a unit** to Selection panel via the **Add** button

The results displayed are now limited by the Organizational Unit selected.
To use a query that selects and displays by Hierarchy:

Most queries using the Duke Cost Object Hierarchy include “by Hierarchy” in the name.

- Follow steps in Chapter 3 to query for a list cost centers by Hierarchy
- Expand InfoArea & InfoProviders and select query (Example: Cost Ctr. Plan vs. Actual, Select & Display by Hierarchy)
- In the selection dialog box -
  - Enter Period/Fiscal Year
  - Select a broader range of Cost Centers
- Click on the Execute button
The results from this query are displayed in a Hierarchy format.

- Results are limited to your security authorization.
- The first column displays the key and name per Duke Cost Object (CODUKEORG).
- New format is accompanied by familiar name in Duke Cost Object (Familiar) column (Example: 1573170 or 3039876).

<table>
<thead>
<tr>
<th>Duke Cost Object</th>
<th>Duke Cost Object (Familiar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>KSDUKE0003170153170</td>
<td>3170153170</td>
</tr>
<tr>
<td>PD0012345</td>
<td>PD0012345</td>
</tr>
</tbody>
</table>

![Hierarchy Format Example](image)
To improve the format in the Duke Cost Object column on the results:

- Right click on the first column heading – Duke Cost Objects (use other methods if desired) and click on the following -
  - Duke Cost Object
  - Display as
  - Duke Cost Object
  - Name

- Right click again on the Duke Cost Objects column and click on the following –
  - Duke Cost Object
  - Display as
  - Nodes
  - Name and Key
More options:

- The steps outlined in Chapter 3 for sorting data, changing the format, or filtering the results can also be used.
- Once a query is filtered for organizational unit or formatted differently, the query can be saved into a Workbook (covered in Chapter 5).
Chapter 5: Saving and Using Workbooks
A Workbook is a powerful tool in BW.

- Represents a collection of Excel spreadsheets
  - With embedded queries that can be formatted per previous chapters
  - Which may contain one or more related worksheets (Sheet 1, 2, etc.)

- Allows you to:
  - Save sorted and filtered queries
  - Save different queries into one view of the data using worksheets in Excel (refer to Chapter 3)
  - Example: You can save two queries into one workbook, like Budget to Actual Reporting and Fund Balances that have been filtered on the same Organizational Unit.

You can save and use your own workbooks or use existing workbooks based on your role (see folders next page).
Workbooks are organized in two folders:

- **Favorites**
  - Contains your own Workbooks of queries that have been sorted, filtered, etc.
  - Available only for your access

- **Roles**
  - Contains existing queries designed for a specific role to provide access to certain SAP capabilities (users with similar needs are assigned to a role)
  - Available to anyone who is assigned to that role in BW
To save a formatted Query into a Workbook in your Favorites folder:

- Filter and sort the query as needed, especially by Duke Cost Object
- Click on the **Save** button on the BEx toolbar
- Click on **Save as new (or existing) workbook**…
- Select and expand the **Favorites** folder button (can’t use Roles here)
- Click once on the **Favorites** folder to open and highlight
- Enter a description of the query in the **Description** field
- Click on the **Save** button
To open a workbook and access a saved query at a later date:

- Click on the **Open** button
- Click on **Workbooks**
- Open either the **Favorites** or **Roles** folders (to the left)
- Open various folders on the right to locate the workbook desired
- Double click on a workbook
- IMPORTANT: Immediately after retrieval, click on the **Refresh** button (BEx toolbar) to update the results of existing queries in the Workbook
To add another Query into an existing Workbook:

Remember that Workbooks can contain more than one query.

- Use the **Refresh** button to update any existing queries
- Queries can be inserted -
  - □ below the results in Sheet 1
  - □ in a separate Sheet 2 (3, etc.) (recommended method)
- Click in the desired location (below results in Sheet 1 or in Cell A1 in Sheet 2)

Steps continued on next page
To add another Query into an existing Workbook (continued):

- Click on the Tools button on the BEx toolbar
- Select Insert query…
- Expand and select query from InfoArea, Favorites, or Roles folders

Steps continued on next page
To add another Query into an existing Workbook (continued):

- In the selection dialog box -
  - Enter Period/Fiscal Year
  - Select Cost Centers
- Click on the Execute button

The second query results show in the location selected in Excel.
Example of existing Workbook construction for two queries:

- Each pulled from different InfoCubes – Example: CO and FM
- Both saved in one workbook
- Each located in different Excel sheets (Sheet 1, 2, etc.)
- Both queries filtered for Provost’s area and unrestricted fund ranges
Chapter 6:
Summary of BW
In summary, BW allows you to:

- Access existing queries
- Analyze, format and filter the queries in various ways, such as:
  - Drilling down to cost element detail
  - Swapping the view of data from cost center to cost element
  - Filtering to view only a certain Organizational Unit
- Save one query or more than one query in a Workbook
- Use the Workbook to analyze data across various queries for all cost objects

You can view and analyze data for all your cost objects (Cost Center, Profit Center, and Projects/WBS Elements) in one easy place versus different reports in R/3.