

SAP HANA Technical Academy



18.6.2014, WU Wien

THE BEST-RUN BUSINESSES RUN SAP™



Agenda



- **SAP HANA**
 - Introduction and Overview
 - SAP HANA Studio
 - Hands-on labs
- **Modeling SAP HANA Views**
 - Attribute Views
 - Analytic Views
 - Calculation Views
 - Hands-on labs
- **Reporting**
 - BusinessObjects Explorer
 - BusinessObjects Web Intelligence
 - Hands-on labs

SAP In-Memory Computing Studio

Look and Feel



The screenshot displays the SAP In-Memory Computing Studio interface. The window title is "Information Modeler - - SAP In-Memory Computing Studio". The menu bar includes "File", "Edit", "Navigate", "Window", and "Help".

Navigator View: Located on the left side, it shows a tree structure of information models. The selected model is "HN1 (D048376)", which contains sub-elements: "HANA2 00", "Default Catalog", "Information Models", "HN1 (DEMO1)", "HN1 (SYSTEM)", "HANA2 00", "Default Catalog", and "Information Models".

Quick Launch View: The main central area displays a "Welcome to Information Modeler" message. It features a "Quick Launch" section with the following categories and items:

- New:**
 - Attribute View
 - Analytic View
 - Calculation View
 - Analytic Privilege
- Setup:**
 - Configure Modeler
 - Configure Import Server
 - Default Model Parameters
 - Generate Time Data
- Functions:**
 - Import
 - Export
 - Data Provisioning
 - SQL Editor
 - Activate
- Documentation:**
 - Quick Start Guide
 - Understand Modeling in the in-memory computing studio
 - New Features in this Perspective

Properties View: Located at the bottom, it displays the message "Properties are not available." and is labeled "Properties View".

The status bar at the bottom left indicates "0 items selected".



Information Modeler Features

- Modeling
 - No materialized aggregates
 - Database views
 - Choice to publish and consume at 4 levels of modeling
 - Attribute View, Analytic View, Analytic View enhanced with Attribute View, Calculation View
- Data Preview
 - Physical tables
 - Information Models
- Import/Export
 - Models
 - Data Source schemas (metadata) – mass and selective load
 - Landscapes
- Data Provisioning for SAP Business Applications (both initial load and replication)
- Analytic Privileges / Security



Information Modeler Terminology

- Data
 - Attributes – descriptive data
 - Measures – data that can be quantified and calculated
- Views
 - Attribute Views – i.e. dimensions
 - Analytic Views – i.e. cubes
 - Calculation Views – similar to virtual provider with services concept in BW
- Hierarchies
 - Leveled – based on multiple attributes
 - Parent-child hierarchy
- Analytic Privilege – security object

SAP In-Memory Computing Studio

Navigator View - Catalog



HANA Instance (<USER>)

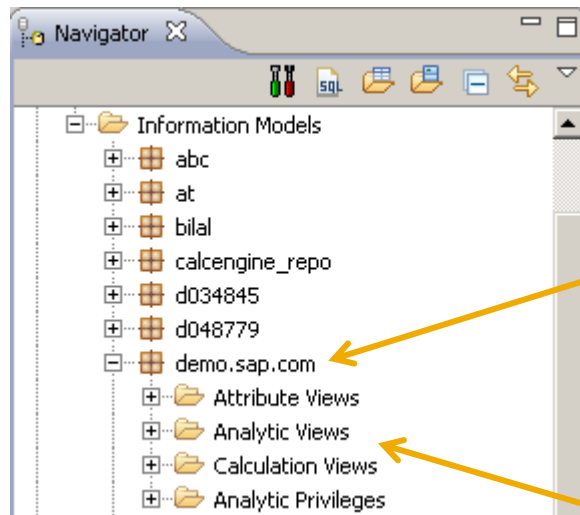
HANA Server Name and Instance Number

User Database schema

Schema Content: Column Views, Functions, Tables, Views

SAP In-Memory Computing Studio

Navigator View - Content



Content is organized in Packages

Attribute Views, Analytic Views, Calculation Views, Analytic Privileges organised in folders

SAP In-Memory Computing Studio

Pre-Delivered Administration Console



Information Modeler - System: IM2 Host: ip-10-79-0-204.cloud.sap.corp Instance: 01 Connected user: SYSTEM - SAP HANA Studio

File Edit Navigate Window Help

Quick Launch IM2

IM2 (SYSTEM) modeling instance ip-1...p 01 Last update: Dec 1, 2011 6:19:00 AM Interval: 60 seconds

Overview Landscape Alerts Performance Volumes Configuration System Information Diagnosis Files

General System Information

Operational State: ▲ 'sapstartsrv' Service not started

Start Time of First Started Service: Dec 1, 2011 5:50:31 AM

Start Time of Latest Started Service: Dec 1, 2011 5:51:31 AM

Distributed System: No

Version: 1.00.16.354058 (NewDB100_REL)

Build Time: Sep 9, 2011 2:47:09 PM

Platform: SUSE Linux Enterprise Server 11.1

Current Alerts

No current alerts

[Show alert history](#)

Physical Memory

Memory Available (GB): 34.19

Memory Used/Available (GB): 3.37 / 34.19

[More information](#)

Data

Size of Disk Containing Data Files (GB): 98.43

Disk Space Used/Available (GB): 61.11 / 98.43

[More information](#)

Virtual Memory

Memory Available (GB): 34.19

Memory Used/Available (GB): 3.37 / 34.19

[More information](#)

Log

Size of Disk Containing Log Files (GB): 98.43

Disk Space Used/Available (GB): 61.11 / 98.43

[More information](#)

CPU

Number of CPUs Available: 4

CPU Usage (%): 0

[More information](#)

Trace

Size of Disk Containing Trace Files (GB): 98.43

Disk Space Used/Available (GB): 61.11 / 98.43

[More information](#)

Properties Console Where-Used list Progress Error Log Validation Log Job Log

Selected:

Number of Usages:

Type	Used in	Package

IM2 (SYSTEM)

Hands-on Lab 1



Go to the first section of the workbook:
SAP HANA Introduction

Labs begin on page 6 / Accessing Cloud systems

Stop at the *Modeling HANA Views* section on page 11

20 minutes

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 - BusinessObjects Web Intelligence
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Modeling Only Possible For Column Tables

- This answers the frequently asked question:
"Where should I put a table – row store or column store?"
 - Information Modeler only works with column tables
 - Replication server creates tables in column store per default
 - Data Services creates tables in column store per default
 - SQL to create column table: "CREATE COLUMN TABLE ..."
 - Store can be changed with "ALTER TABLE ..."

System Tables Are Created Where They Fit Best

- Administrative tables in row store:
 - Schema SYS → caches, administrative tables of engine
 - Tables from statistics server
- Administrative tables in column store:
 - Schema _SYS_BI → metadata of created views + master data for MDX
 - Schema _SYS_BIC → some generated tables for MDX
 - Schema _SYS_REPO → e.g. lists of active/modified versions of models

Import Source System metadata

- Physical tables are created dynamically (1:1 schema definition of source system tables)

Create Information Models

- Database Views are created
 - Attribute Views
 - Analytic Views
 - Calculation Views

Consume

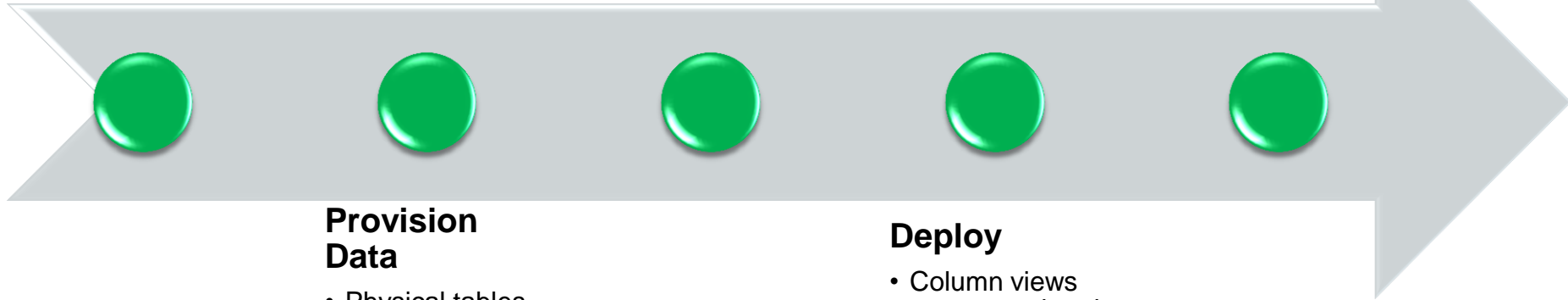
- Consume with choice of client tools
- BICS, SQL, MDX

Provision Data

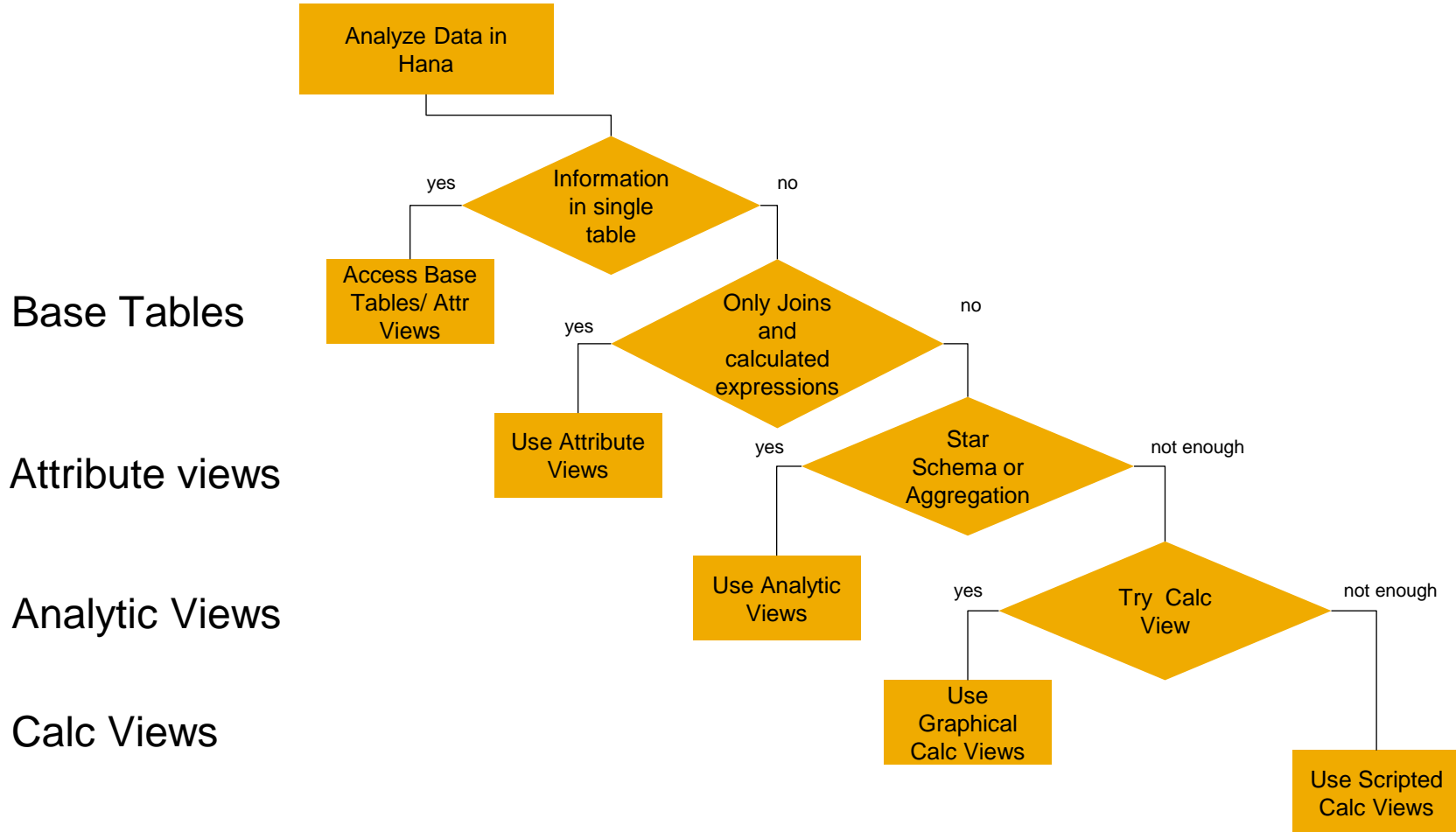
- Physical tables are loaded with content.

Deploy

- Column views are created and activated

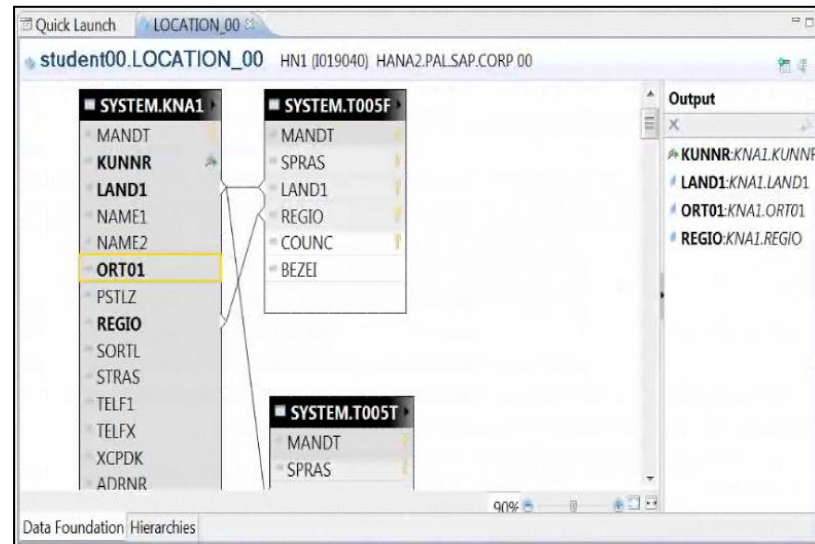


Framework for Modeling within HANA



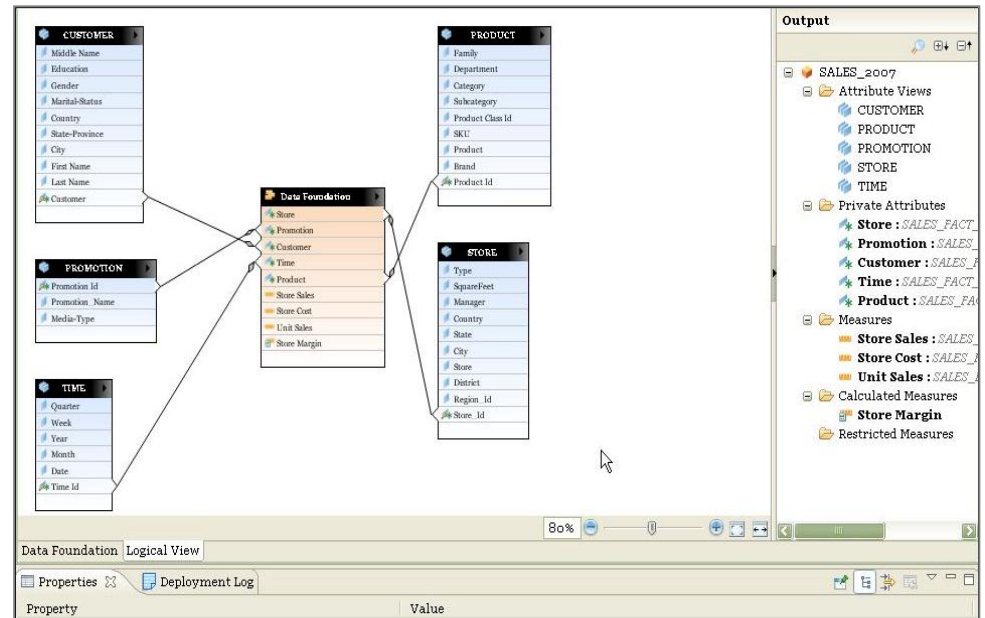
Attribute View

- What is an Attribute View?
 - Attributes add context to data.
 - Attributes are modeled using Attribute Views.
 - Can be regarded as Master Data tables
 - Can be linked to fact tables in Analytical Views
 - A measure e.g. weight can be defined as an attribute.
- Table Joins and Properties
 - Join Types
 - leftOuter, rightOuter, fullOuter, textTable
 - Cardinality
 - 1:1
 - N:1
 - 1:N
 - Language Column



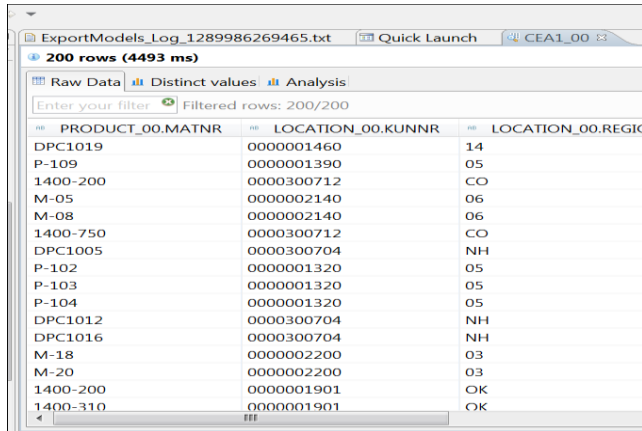
Analytical View

- An Analytical View can be regarded as a “cube”.
- Analytical Views does not store any data. The data is stored in column store or table view based on the Analytical View Structure.
- Attribute and Measures
 - Can create Attribute Filters
 - Must have at least one Attribute
 - Must have at least one Measure
 - Can create Restricted Measures
 - Can create Calculated Measures
 - Can rename Attribute and Measures on the property tab



Analytical View: Data Preview

- There are three main views one can select from when previewing data.
 - Raw Data – table format of data
 - Distinct Values – graphical and text format identifying unique values
 - Analysis – select fields (attributes and measures) to display in graphical format.



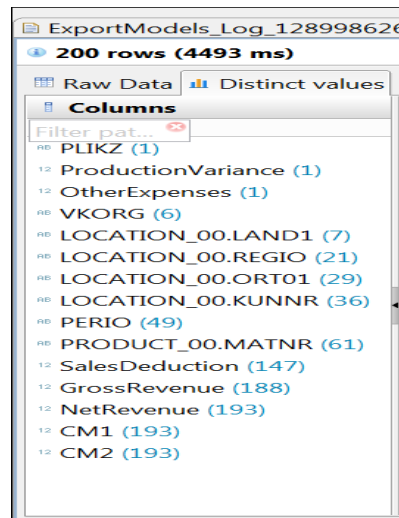
ExportModels_Log_1289986269465.txt Quick Launch CEA1_00

200 rows (4493 ms)

Raw Data Distinct values Analysis

Enter your filter Filtered rows: 200/200

PRODUCT_00.MATNR	LOCATION_00.KUNNR	LOCATION_00.REGIO
DPC1019	0000001460	14
P-109	0000001390	05
1400-200	0000300712	CO
M-05	0000002140	06
M-08	0000002140	06
1400-750	0000300712	CO
DPC1005	0000300704	NH
P-102	0000001320	05
P-103	0000001320	05
P-104	0000001320	05
DPC1012	0000300704	NH
DPC1016	0000300704	NH
M-18	0000002200	03
M-20	0000002200	03
1400-200	0000001901	OK
1400-310	0000001901	OK



ExportModels_Log_1289986269465.txt

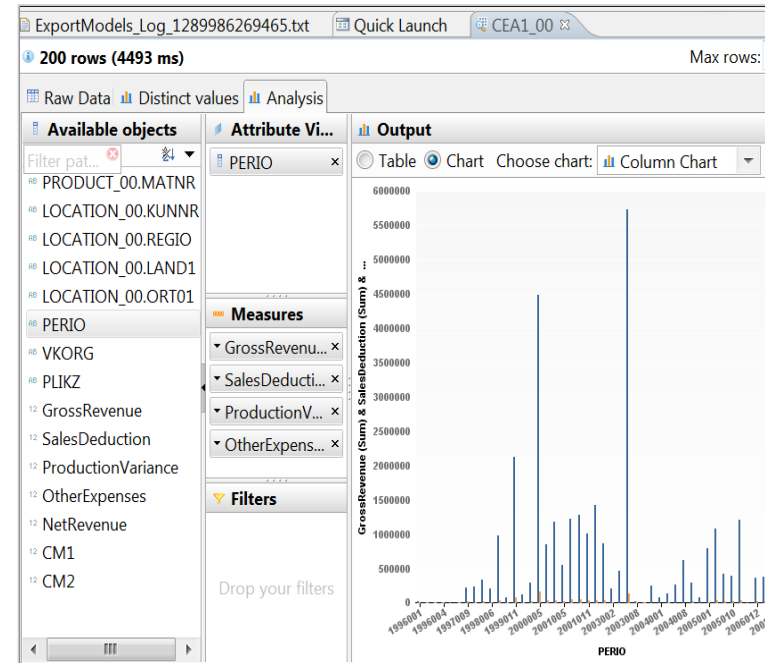
200 rows (4493 ms)

Raw Data Distinct values

Columns

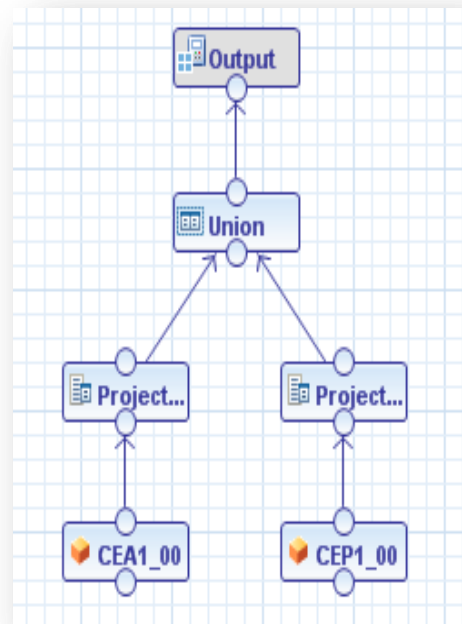
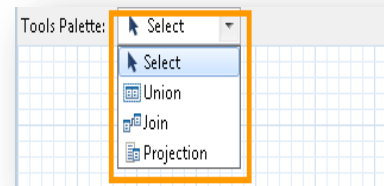
Filter pat...

- PLIKZ (1)
- ProductionVariance (1)
- OtherExpenses (1)
- VKORG (6)
- LOCATION_00.LAND1 (7)
- LOCATION_00.REGIO (21)
- LOCATION_00.ORT01 (29)
- LOCATION_00.KUNNR (36)
- PERIO (49)
- PRODUCT_00.MATNR (61)
- SalesDeduction (147)
- GrossRevenue (188)
- NetRevenue (193)
- CM1 (193)
- CM2 (193)

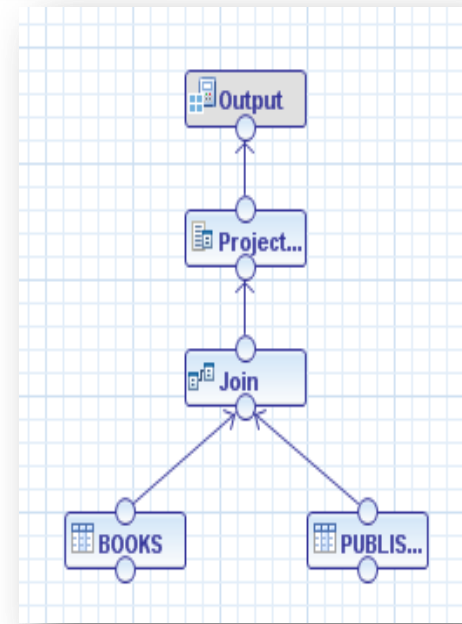


Calculation View Graphical

- No SQL coding required
- Union, Join, Projection nodes provided
- Join Column Tables (Analytical Views)



UNION

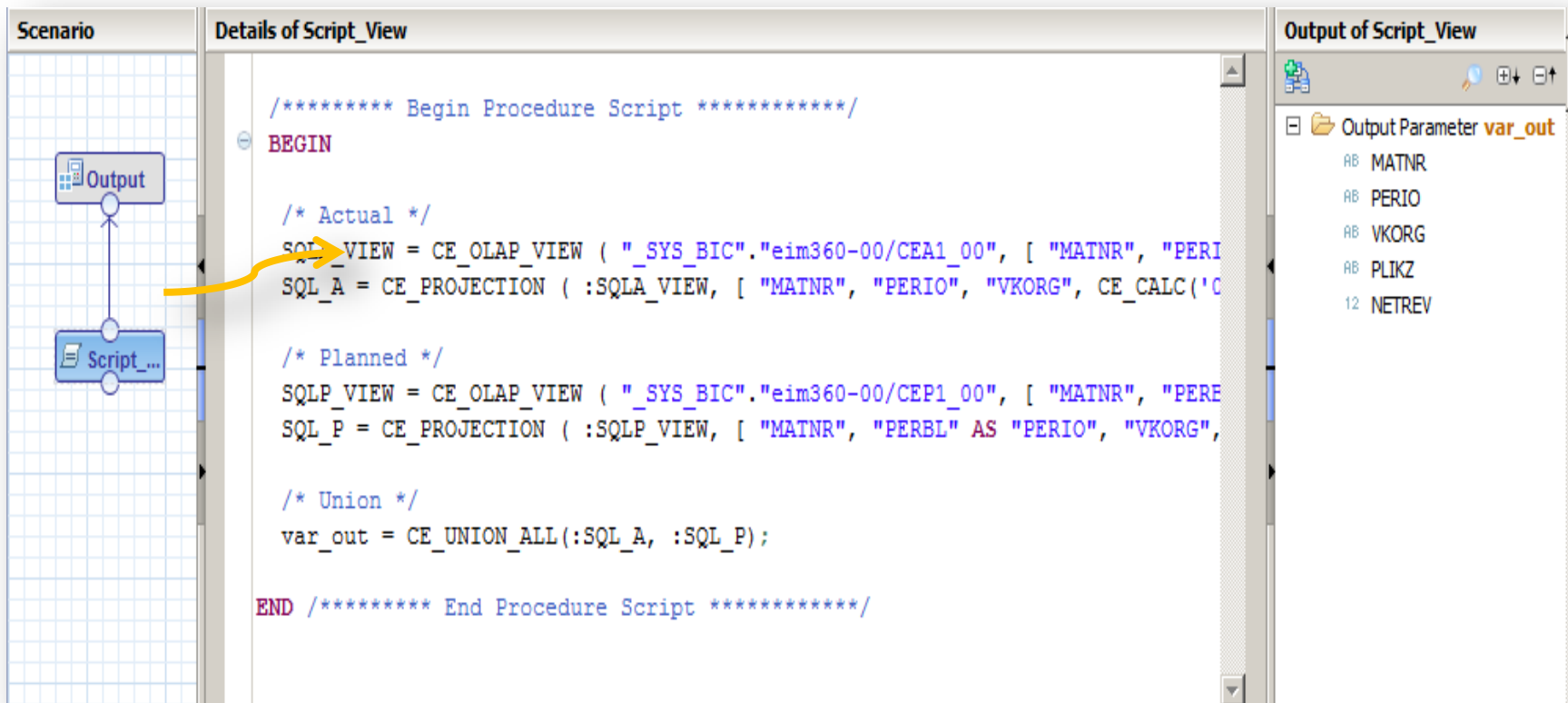


JOIN

Calculation View

SQLScript (Script-based)

- SQL or SQLScript required to create Script based Calculation Views
- Write SQL Select statements against existing raw tables or Column Stores (preferred)
- Define output structure, activation creates column store based on Script Output



The screenshot displays the SAP Studio interface for configuring a Script-based Calculation View. It is divided into three main panes:

- Scenario:** Shows a flow diagram with an 'Output' node connected to a 'Script...' node.
- Details of Script_View:** Contains the SQLScript code for the calculation view. A yellow arrow points from the 'Script...' node in the Scenario pane to the SQLScript code.
- Output of Script_View:** Shows the resulting output structure, which is an 'Output Parameter var_out' with the following columns:

Column Name	Column Type
MATNR	AB
PERIO	AB
VKORG	AB
PLIKZ	AB
NETREV	12

```
/* ***** Begin Procedure Script ***** */
BEGIN

/* Actual */
SQL_VIEW = CE_OLAP_VIEW ( "_SYS_BIC"."eim360-00/CEA1_00", [ "MATNR", "PERIO" ] )
SQL_A = CE_PROJECTION ( :SQL_VIEW, [ "MATNR", "PERIO", "VKORG", CE_CALC('C' ) ] )

/* Planned */
SQLP_VIEW = CE_OLAP_VIEW ( "_SYS_BIC"."eim360-00/CEP1_00", [ "MATNR", "PERIO" ] )
SQL_P = CE_PROJECTION ( :SQLP_VIEW, [ "MATNR", "PERBL" AS "PERIO", "VKORG", CE_CALC('C' ) ] )

/* Union */
var_out = CE_UNION_ALL (:SQL_A, :SQL_P);

END /* ***** End Procedure Script ***** */
```

SQLScript / R / BFL (Business Function Library)

Three ways to implement in-memory data mining and statistical analysis



SQLScript

- SQLScript is a set of SQL extensions which allow developers to push data-intensive logic into the database in order to avoid massive data copies to the application server and to leverage sophisticated parallel execution strategies of the database.

R

- Through the R integration solution, developers can leverage open source R's 3000+ external packages to perform wide-range data mining and statistical analysis.

BFL (Business Function Library)

- BFL is the calculation library for the applications built on top of the SAP HANA database. The business functions are written in C++ and executed in database calculation engine. BFL has a roadmap for data mining and statistical algorithms.

- The set of SQL extensions for the SAP HANA database which allow developers to push data intensive logic into the database is called SQLScript.
- These extensions are keys to avoiding massive data copies to the application server and to leverage sophisticated parallel execution strategies of the database.
- SQLScript V2 supports stored procedures, which provides enhanced control flow capabilities and is positioned to be more suitable for pushing complex parts of application logic to the database.
- It can meet some simple requirement for reporting, like join, aggregation, etc. When it comes to data mining and statistic analysis, SQLScript is not suitable for implementing complex algorithms.

Hands-on Lab 2



Go to the second section of the workbook:
Modeling HANA Views

Labs begin on page 11

Stop at the *Reporting from SAP HANA* section on page 56

60 minutes

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Business Intelligence and Enterprise Information Management in an SAP Environment

Integrated solutions designed to work together

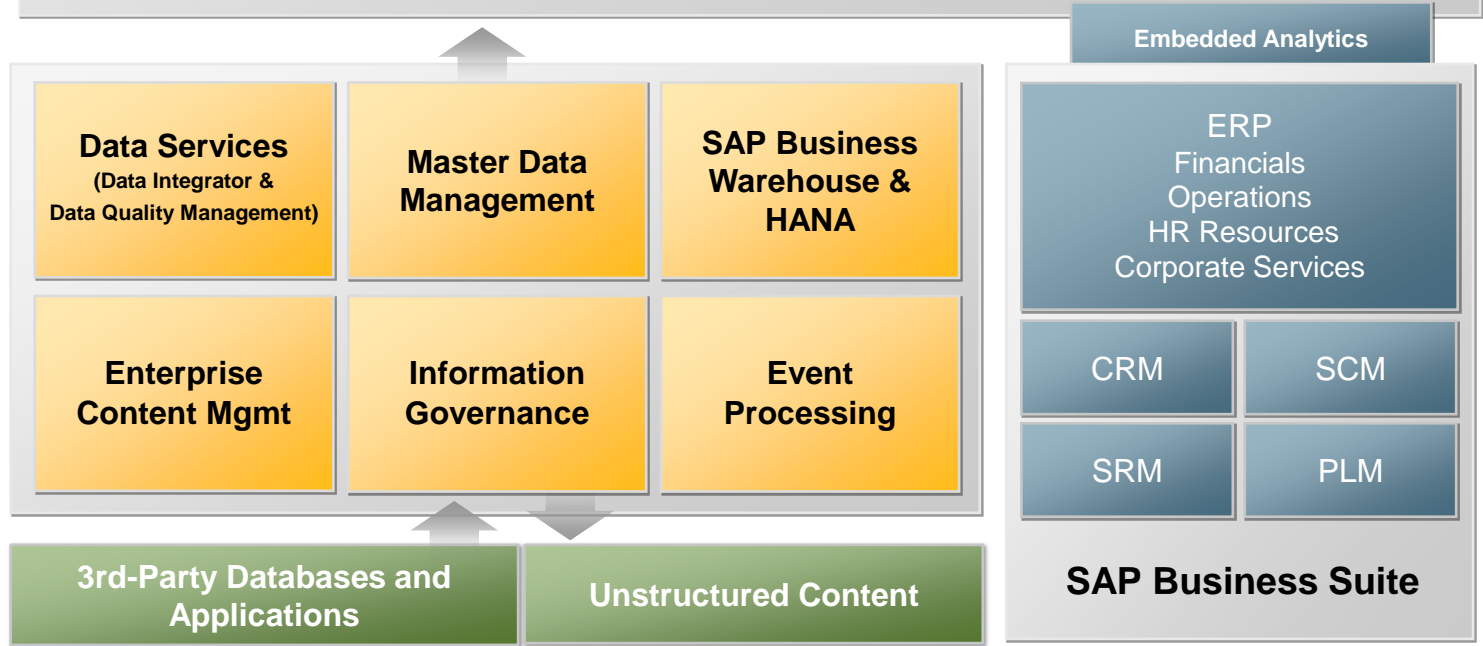


BI Platform



EIM Foundation

Information Governance



SAP BusinessObjects BI Platform

One Unified Business Intelligence Suite



Budget Overrun Dashboard (IDES The Delta College)

Product Categories

Product Categories	Product Line	Qty Ordered	Sales Amount
All Products	Accessory	23,358	604K
	Mountain	16,898	10,251K
	Road	15,552	14,624K
	Touring	4,590	3,875K
Total		60,398	28,310K

Balance Sheet (Last Date Update: 4/30/2009)

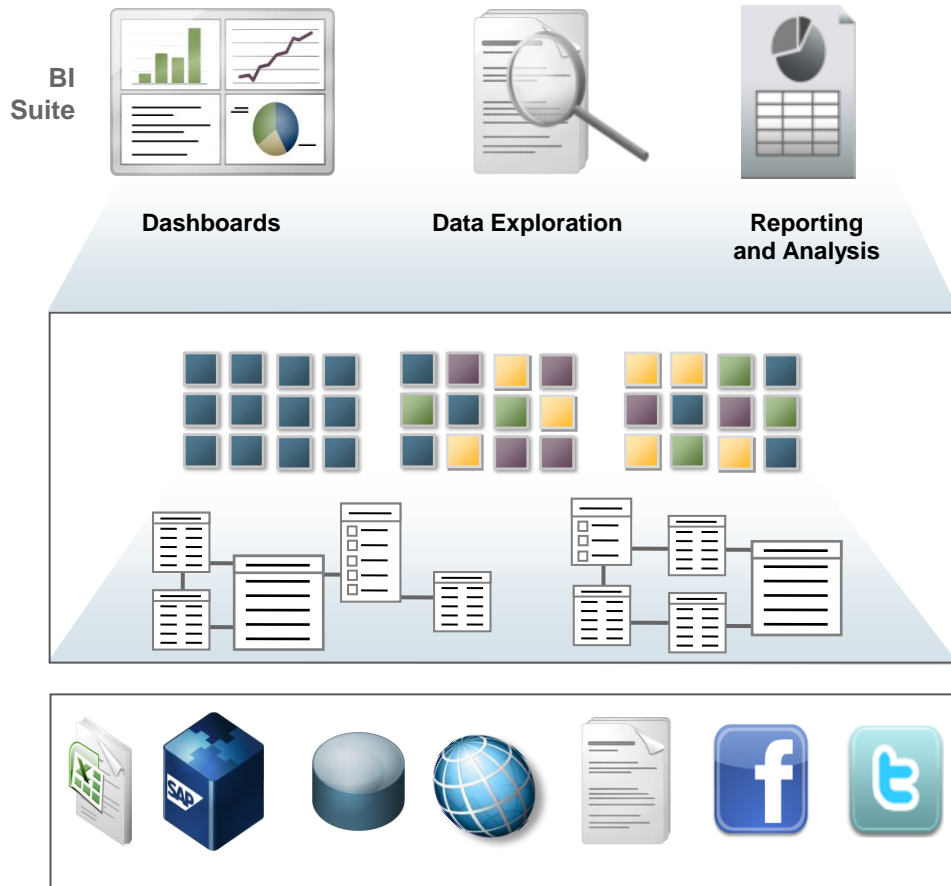
Assets	Current Year	Prev
Fixed Assets	5,185,260.41	0.00
Intangible Assets	5,185,227.77	
Tangible Assets		
Financial Assets		29
Current Assets		
Stocks		
Receivable and Other Assets		
Securities		
Cash		
Other Assets		
Total Assets		

BI Platform components:

- Dashboards
- Web Intelligence
- Analysis
- Crystal Reports
- Explorer

Trusted Data / Common Meta Data Layer

Data Under a Single Metadata Umbrella



For business users

- Simplify user experience
- Increase productivity
- Provide trust in information

For IT departments

- Reduce BI delivery cost
- Increase user self-sufficiency
- Leverage one security model

What Is Explorer? It's Search Against Bl...



Use familiar key-word search to find business information

- Answers “on-the-fly” and investigative questions

Searches directly on pre-indexed data

- No previous reports or metrics need exist
- Provides fast search and exploration

Search results: Information Spaces:

Score	5 Result(s)
	<ul style="list-style-type: none">▶ Fashion Store and Product Information Contains information about the sales of products and store performance for eFashion retail.
	<ul style="list-style-type: none">▶ Sales Information This is the sales information - contains key figures for sales and discounting, for all product
	<ul style="list-style-type: none">▶ STS Sales STS Sales retail sales information space which contains key figures for sales and discounting for
	<ul style="list-style-type: none">▶ Industry Breakdown Breakdown of companies by industry and segment
	<ul style="list-style-type: none">▶ Department of Defense Parts Procurement Contains information about parts orders and contractors for the DoD.

Searches across all data sources

- Any universe accessible source
- Any SAP NetWeaver BW Accelerator accessible source

...and Then It's Exploration Of the Results



Intuitively explore on data

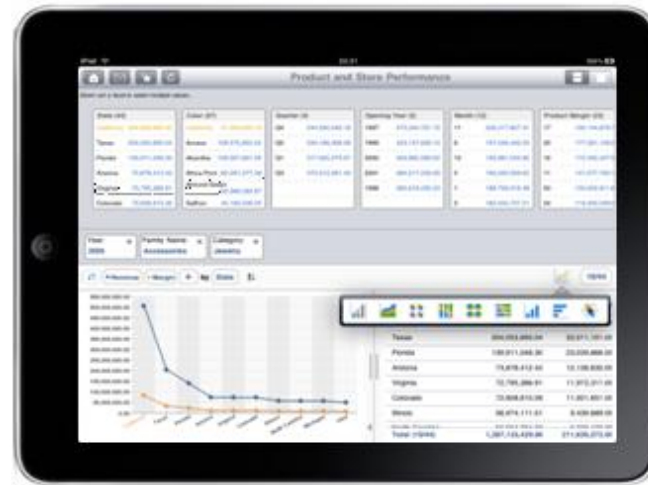
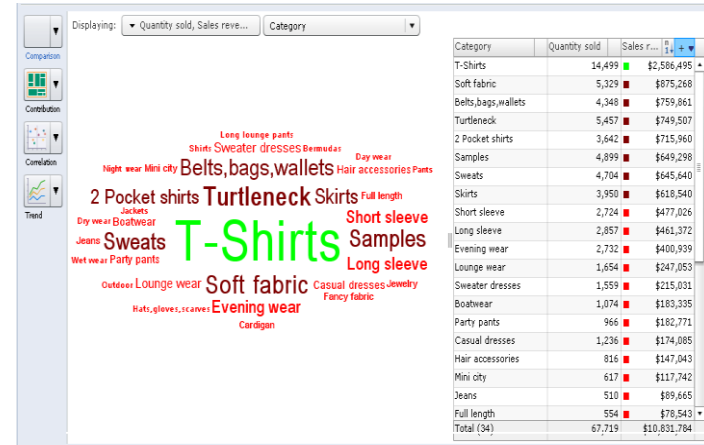
- No data model or data knowledge required
- Web or Mobile

Automated relevancy of results

- Most relevant information is displayed first
- Best chart type auto generated

Share insights with others

- Export to CSV or image
- Save it locally as a browser bookmark
- One-click send to email



SAP BusinessObjects Explorer Main Screen



SAP BusinessObjects Explorer - Windows Internet Explorer

http://idesboexplorerbe.wdf.sap.corp:8080/polestar/

Welcome: smithjo | Manage Spaces | Log Off | Help | Feedback | Demos | About

Home | Search Results: car audi 2007 revenue | Explore: Car Sales

car audi 2007 revenue x Refreshed on: 2010/05/10 16:05 Records 23,590 / 85,000,000 (1.186s)

Measures (1/3 max)

- Sales Revenue in \$...
- Sales Commission i...
- Discount in \$ (SUM)

Add Calculation...

Dealer Name	Sales Year	Model Name	Cal Colour	Sales State
NAPPIER CA...	2007	A3	YELLOW	PA
SHELBY CAR ...	2008	AVANT	MAROON	NY
MADDOX CA...		S4	VIOLET	IL
VICKERS CA...		A4	ORANGE	MA
LOVETT CAR...		CABRIOLET	SEAGREEN	WA
BASKET CAR ..		TT	BROWN	TX
OSBORNE C...		A6	LIGHTBLUE	NJ
SILVERMAN ...		R8	GREEN	CO

Car Year: 2007 | Make Name: AUDI

Displaying: Sales Revenue in \$ | Sales State

Sales State	Sales Revenue...
PA	220,835,430.00
NY	175,218,763.00
IL	144,073,717.00
MA	98,728,039.00
WA	50,003,189.00
TX	47,924,970.00
Total (38)	1,081,975,214.00

Local intranet | Protected Mode: Off | 100%



BusinessObjects Web Intelligence empowers your users with self-service information access and interactivity, while delivering:

- Powerful on-line and offline ad hoc query and reporting utilizing Semantic Layer
- Integrated and trusted analysis for all users especially power users
- A tool built upon the most complete, trusted, and agile business intelligence (BI) platform

Loss Cause Ranking

Data | Templ.. | Map | Proper..

Data

- Loss Cause Ranking
 - L01 Ins.Line of Bus.
 - L01 Loss Cause
 - Claim Count
 - Cost Per Case
 - Expenditure
 - Frequency
 - Severity

Cause of Loss Point in Time Ranking

Auto Insurance **Frequency Ranking**

Cause of Loss	Claim Count	Incurred	Cost Per Case	Frequency	Severity
Not assigned	36	\$418,359	\$11,621	49.32%	54.55%
Insured Rear-Ended Third Party	12	\$26,543	\$2,212	16.44%	3.46%
Intersectional Accident	6	\$27,800	\$4,633	8.22%	3.63%
Insured Ran Red Light	5	\$36,000	\$7,200	6.85%	4.69%
Theft	5	\$157,650	\$31,530	6.85%	20.56%
Third Party Rear-Ended Insured	3	\$1,400	\$467	4.11%	0.18%
Unknown/Unable to Establish	3	\$22,518	\$7,506	4.11%	2.94%
Third Party Ran Red Light	2	\$76,400	\$38,200	2.74%	9.96%
Single Vehicle Accident	1	\$200	\$200	1.37%	0.03%
Sum:	73	\$766,870	\$11,508		

Make Query Building Easy with an Intuitive, Web-Based Interface



- With Web Intelligence, users can access and format information to suit their needs with an easy-to-use, drag-and-drop Web interface.
- Customize the zero-footprint Web interface to meet specific user segments inside and outside of the organization.
- With minimal knowledge of the underlying data structures, users can access and synchronize data from multiple sources (whether structured, text-based, or even Excel spreadsheets, CSV, and txt files), create custom formulas, and use variables within a single report.

The screenshot displays the 'Create Query' web interface. On the left, the 'Object Properties' panel shows the selected object 'Year' with a qualification of 'Dimension' and a type of 'String'. Below this, the 'Query Properties' panel indicates the source file is 'c:\documents and settin...', and both 'Refreshable' and 'Editable' options are checked. The main area shows 'Result Objects' with buttons for 'Country', 'Year', 'Object3', 'Revenue', and 'Object6'. Below the buttons is a 'Data Samples' table with the following data:

Country	Year	Object3	Revenue	Object6
France	2001	DC	508564.2	512.58
USA	2003	Florida	548845.9	842.66
England	2005	Illinois	153546.5	562.55
Spain	2001	Massachussets	854812.5	966.56
Canada	2005	New York	894241.2	648.12
Italy	2004	Texas	841535.5	687.09
Germany	1999	California	849234.7	542.68
Russia	2006	Colorado	658742.8	452.58
Portugal	2000	Oregon	234547.8	879.08
Morocco	2000	Delaware	564825.1	976.23

Awesome Formatting Options



Year Quarter SubClaim Analysis x

Data Templa... Map Propert...

Data

- Year Quarter SubClaim Analysis
 - L00 Claim Number
 - L01 Cal. Year/Quarter
 - L01 Subclaim Type
 - Claim Count
 - Expenditure
 - Initial Reserve

Drop objects here to add simple report filters.

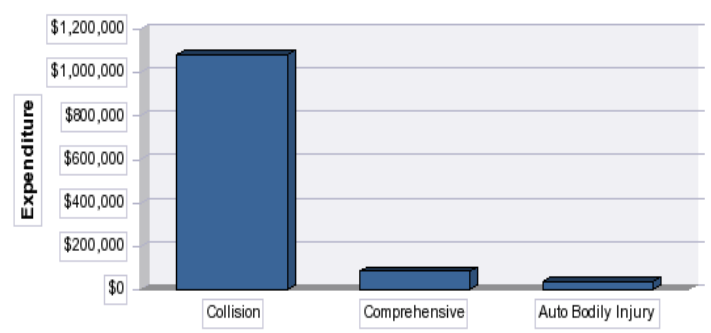
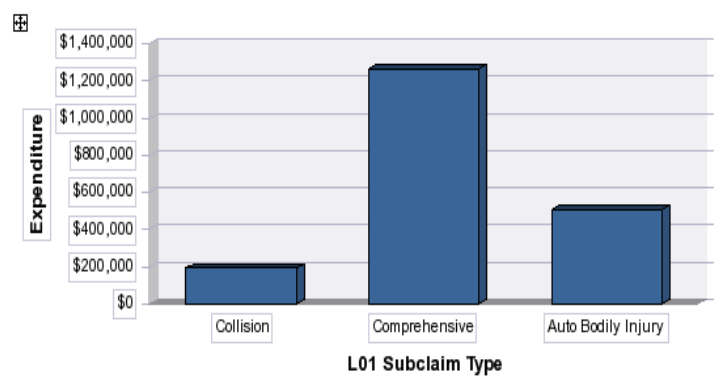
Subclaim Ranking

Q2 2008

Subclaim Type	Claim Count	Initial Reserve	Total Incurred	L00 Claim Number
Collision	81	\$184,100	\$193,294	All Claim Number
Comprehensive	37	\$799,000	\$1,265,155	All Claim Number
Auto Bodily Injury	18	\$525,000	\$504,000	All Claim Number
	136	1,508,100	1,962,448.85	

Q3 2008

Subclaim Type	Claim Count	Initial Reserve	Total Incurred	L00 Claim Number
Collision	823	\$1,057,000	\$1,081,512	All Claim Number
Comprehensive	17	\$92,000	\$82,500	All Claim Number
Auto Bodily Injury	4	\$45,000	\$35,000	All Claim Number
	844	1,194,000	1,199,012.48	



Hands-on Lab 3



Go to the third section of the workbook:
Reporting from SAP HANA

Labs begin on page 56

Thank you!

Please fill out the survey before leaving today!

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