

# ASUG Illinois Chicago Chapter

## Building Simple Models in HANA

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Pravin Gupta & Sandeep Khare  
TekLink International Inc.  
[www.tli-usa.com](http://www.tli-usa.com)

**JUERGEN LINDNER**  
SAP POINT OF CONTACT  
MEMBER SINCE: 1998

**LINDA WILSON**  
ASUG INSTALLATION MEMBER  
MEMBER SINCE: 1999

**ATUL PATANKAR**  
ASUG INSTALLATION MEMBER  
MEMBER SINCE: 2000

# SAP HANA Studio Features

- Modeling
  - Information Models

Information models are used to create multiple views of transactional / master data that can be used for analytical purposes.
  - Three Types of Information Models  
Attribute View, Analytic View, Calculation View
  - Database Views / Column Stores
  
- Data Preview
  - Physical tables
  - Information Models
  
- Import/Export
  - Models
  - Metadata
  - Delivery Units – One or more packages
  
- Data Provisioning (both initial load and replication)
- Analytic Privileges / Security
- Troubleshooting / Trace / Logs

# [ Terminology

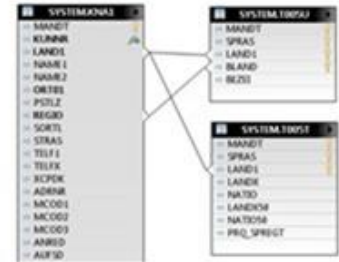
- Data
  - Attributes - descriptive data (known as Characteristics SAP BW terminology)
    - Calculated Attributes
  - Measures - data that can be quantified and calculated (known as key figures in SAP BW)
    - Calculated Measures & Restricted Measures
- Views
  - Attribute Views - i.e. dimensions
    - Analytic Views - i.e. cubes
  - Calculation Views - similar to virtual provider with services concept in BW
    - Graphical
    - Script (SQL Script, CE Function)
      - Procedure
  - Re-usable functionality
    - Analytic Privilege - security object
    - Analytic Privileges

# Modeling for HANA 1.0 Using HANA Studio

## Step1: (Attribute View)

### Separate Master Data Modeling from *Fact data*

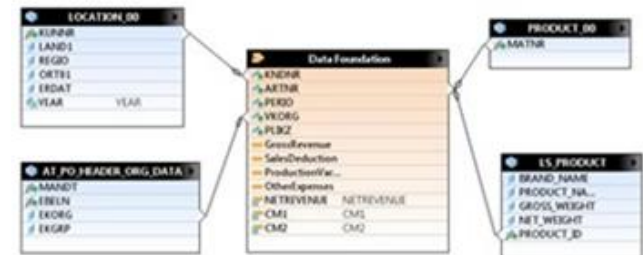
- Build the needed master data objects as 'Attribute Views'
  - Join text tables to master data tables
  - If required: join master data tables to each other (e.g. join 'Plant' to 'Material')



## Step 2: (Analytical View)

### Create *Cube-like* view by joining attributes view to *Fact data*

- Build a 'Data Foundation' based on transactional table
  - Selection of 'Measures' (key figures) ...
  - Add attributes (docking points for joining attribute this is basically your 'fact table' (key figures and dimension IDs)
- Join attribute views to data foundation
  - Looks a bit like a star schema

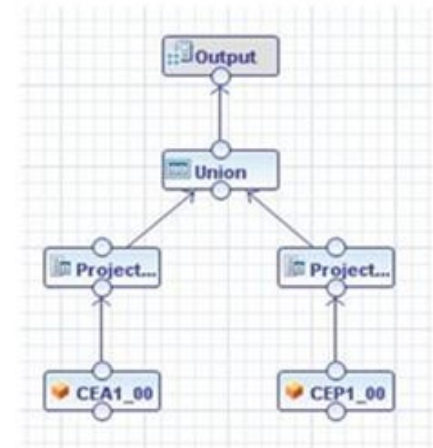
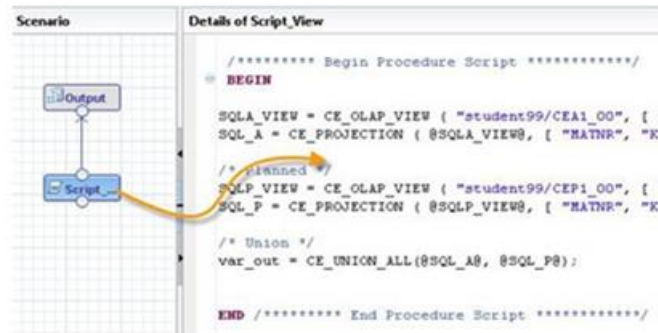


# Modeling for HANA 1.0 Using HANA Studio

## Step 3: (Calculation View) / Optional

If joins are not sufficient -> create a Calculation View that is something that looks like a View and has SQL Script inside

- Composite view of other views (tables, re-use join, OLAP views)
- Consists of a Graphical & Script based editor
- SQL Script is a HANA-specific functional script language
  - Think of a 'SELECT FROM HANA' as a dataflow
  - JOIN or UNION two or more data flows
  - Invoke other (built in CE or generic SQL) functions



# Modeling for HANA 1.0 Using HANA Studio

## Step 4: Analytic Privileges

Analysis authorizations for row-level security

- Can be based on attributes in analytic views
- Analytic privilege is always a concrete implementation
  - I.e. Specific authorization for specified values of given attribute
  - you have to create privileges for each group of users

Select an Attribute to define filter

- CEA1\_00 (student99)
  - LOCATION\_00 (student99)
    - KUNNR
    - LAND1
    - REGIO
    - ORT01
    - ERDAT
  - PRODUCT\_00 (student99)
    - MATNR
    - PERIO
    - VKORG
    - PLIKZ

**General**  
 Describes general information about the Analytic Privilege  
 Name:  Description:   
 Applicable to all Information Models

**Reference Models**  
 Restrictions apply to all the information models shown in the list below.

Content	Add
CEA1_00 (student99)	Remove

**Associated Attributes Restrictions**  
 A privilege without restrictions implies unrestricted access to the Information Models content

Model Name	Attributes	Description	Count	
LOCATION_00 (student99)	REGIO		2	Add Remove

**Assign Restrictions**  
 Assign the restrictions for LOCATION\_00.REGIO

Operator	Value	
Equal	03	Add
Between	11-14	Remove

# Attribute Views

## What is an Attribute View?

- Attributes add context to data - are the reusable dimensions used for analysis
- Can be regarded as Master Data tables
- Can be linked to fact tables in Analytical Views

## Steps for creating an Attribute View

1. Set Parameters [Name / Description, Type – Standard / Time (Gregorian / Fiscal)]
2. Select Table(s) – Master Data, Text
3. Define Table Joins and Properties
4. Select Attributes
5. Create Hierarchy (Level / Parent Child)
6. Activate the view - Creates Column View  
'\_SYS\_BIC.<PACKAGE>/<VIEW\_NAME>'
7. Preview Data

# Attribute View: Define Join properties

## Table Joins and Properties

- Join Types
  - Referential
  - Inner
  - Left Outer
  - Right Outer
  - Text Join
- Cardinality
  - 1:1
  - N:1
  - 1:N
- Language Column (for text join)
- Note: the direction in which you draw the join matters (left table first)

student99.LOCATION\_00 WR1 (STUDENT99) hphanar02.wdf.sap.corp 01

The screenshot shows the 'Data Foundation' tab in SAP HANA Studio. It displays a join configuration between two tables: SYSTEM.KNA1 (left) and SYSTEM.T005U (right). The join is defined on the LAND1 column of both tables. The join type is set to Text Join and the cardinality is 1:1. The language column is set to SPRAS. The 'Properties' pane at the bottom shows the following configuration:

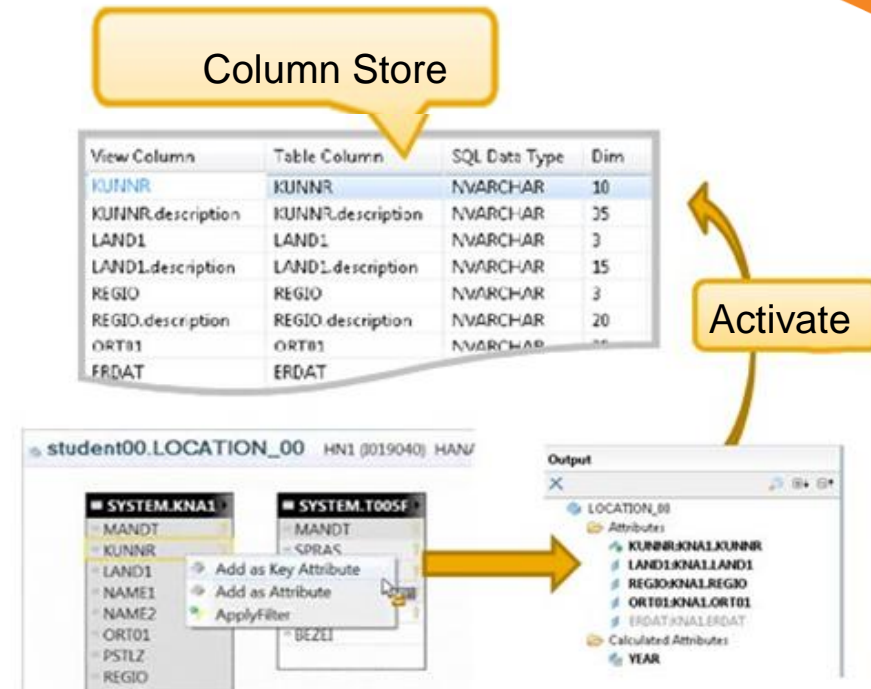
Property	Value
Left Column	
Right Column	
Cardinality	1:1
Join Type	Text Join
Left Table	SYSTEM:KNA1
Right Table	SYSTEM:T005U
Language Column	SPRAS



# Attribute View: Output field selection and filters

## Select Attributes to show up in view

- The output structure of the view must be explicitly defined
  - At least one key attribute is required.
  - Any number of non-key attributes may be defined.
- Define static filter values
  - Can be based on any table column
  - Column does not need to be selected for output ([key] attribute)
- For each attribute in the output structure one can define a description mapping
  - Select the attribute in the output structure
  - Description mapping is configured in the 'Properties' view for the attribute
  - Description mapping shows all fields of all tables which are joined in the attribute view.



# Analytical View :

## What is an Analytic View

- An Analytic View can be regarded as a “cube”
  - Multidimensional reporting model
    - **Fact table** (data foundation) joined against modeled **dimensions** (attribute views)
- Analytic Views do not store data
  - Data is read from the joined database tables
  - Joins and calculated measures are evaluated at run time
  - Master data for MDX/BICS are stored in system tables

## Steps for creating an Analytic View

1. Set Parameters (Name / Description)
2. Select Table(s) – Data Foundation (Measures from single Fact table)
3. Select Attribute View(s) - Dimensions
4. Select Attributes and Measures (in Data Foundation Tab)
5. Join Attribute Views to the data foundation (logical view tab)
6. Select Attributes and Measures and Define Calculated/Restricted Measures
7. Save & Activate the view - Creates Column View  
'\_SYS\_BIC.<PACKAGE>/<VIEW\_NAME>'
8. Preview Data – Raw Data, Distinct Vale, Analysis

# Analytic View (Tabs) :

## Two steps of view creation reflected in editor tabs

- Tab 'Data Foundation' -> Create the data foundation ('fact table')
  - Optional: Join other tables - Facts from Single Table
  - Select attributes and measures from table(s) -> this defines the data foundation
  - Optional: create calculated and restricted measures
- Tab 'Logical View' -> Join Attribute Views to the data foundation
  - This is where you can drag attribute views into the editor

**Data Foundation**

**Logical View**

**Attribute Views**

**Table**

**FACT Table**

The image displays two screenshots of the SAP HANA Analytic View editor. The left screenshot shows the 'Data Foundation' tab, where a table named 'D051516.ACTUALS\_DATA' is selected. The table's columns are listed: MANDT, DOCUMENT\_ID, CUSTOMER\_ID, PRODUCT\_ID, YEAR, and SALES\_VOLUME. The right screenshot shows the 'Logical View' tab, where the same data foundation is joined with two attribute views: 'RB\_TEST\_CUSTOMER\_02' (with columns CUSTOMER\_NUMBER and CUSTOMER\_SEGMENT) and 'RB\_TEST\_PRODUCT\_02' (with columns PRODUCT\_NUMBER and PRODUCT\_CATEGORY). The data foundation is highlighted as the 'FACT Table'. Callouts in yellow boxes and speech bubbles identify these elements.

# [ Analytic View (Contd.) :

## Analytic View (Data Foundation)

### ▪ 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 properties tab

### Calculated Measures

- Aggregation (sum, min, max, count), Data Types (decimals, numbers etc.)
- Expressions / Operators
- Functions (String, Date Math, Conversion etc.)

### Restricted Measures

- Restrict based on Attribute Value e.g. Restrict Gross Revenue by Country='US'



# Demo & Hands On

# [ Your Turn!



## Questions?

How to contact us :  
Pravin Gupta & Sandeep Khare  
[Pravin.Gupta@tli-usa.com](mailto:Pravin.Gupta@tli-usa.com)  
[Sandeep.Khare@tli-usa.com](mailto:Sandeep.Khare@tli-usa.com)

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Thank you.]