Realtime Financial Reporting using SAP S/4 HANA Embedded Analytics

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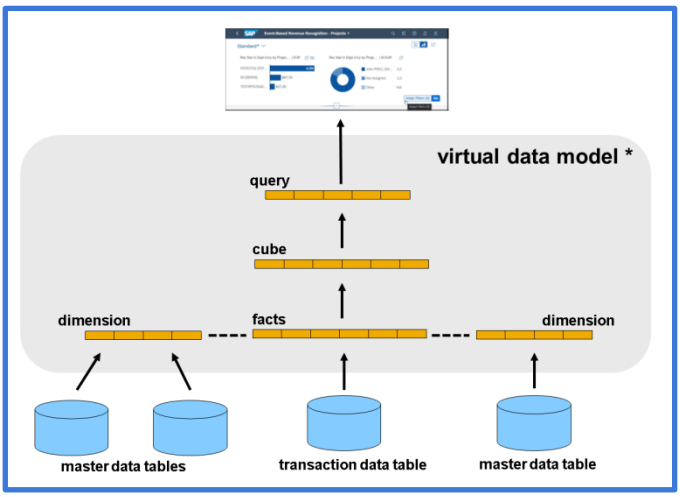
Abstract

SAP S/4 HANA offers many advanced capabilities over its previous system versions, one of these is Embedded Analytics. The tools like ABAP CDS views, SET hierarchies and real time hierarchy replication i.e., HRRP_REP help to enable real time operational reporting. For Financial Accounting Business users who work to produce the Quarterly financial results of an organization, having the ability to report on real time data is a key requirement. Traditional Business Warehouse(BW) approaches where data is extracted, transformed and loaded does not serve very well for this purpose.

Keywords: SAP HANA, Embedded Analytics, Operational Reporting, ABAP CDS Views, SET Hierarchies.

1 Introduction: SAP S/4HANA Embedded Analytics integrates real-time analytics directly within the transactional system, bridging the gap between transactions and analytics. It eliminates the traditional separation between operational systems (OLTP) and analytics systems (OLAP) by leveraging the power of SAP HANA's in-memory computing and advanced data processing capabilities. Since data resides in a single system, it eliminates the need for maintaining separate data warehouses or data marts, reducing complexity and costs. This enables organizations to monitor, analyze, and act on business data instantly, driving operational efficiency and efficient financial reporting process to quickly produce quarterly results.

2 Architecture: SAP S/4HANA embedded analytics includes two components:
1- Analytical applications to display and create analytical content
2- An enterprise-wide, virtual data model



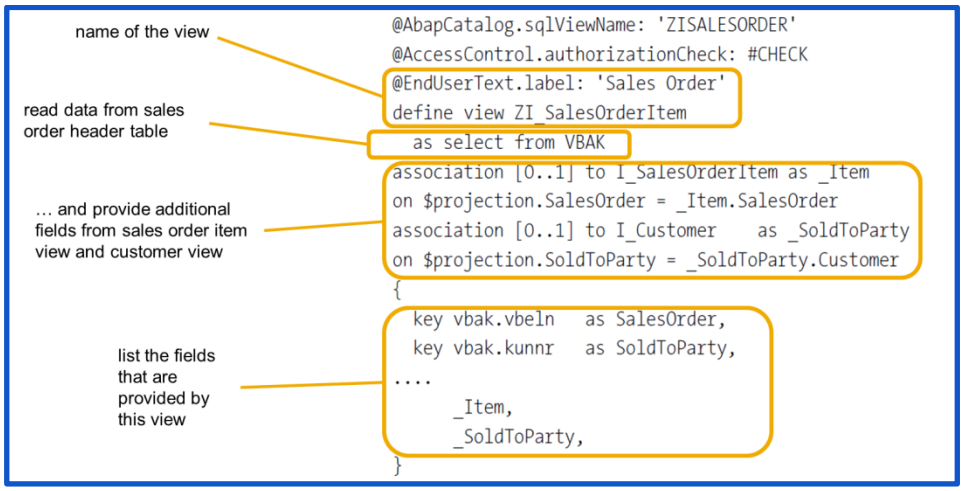
The virtual data model is built entirely from ABAP CDS views. No data is persisted in the virtual data model, as the name suggests. The approach taken is to stack the views in layers. Each layer provides a service to the next layer. The lowest layer does the job of combining data from tables to create a data set. The next layer of views generates cubes of data which is then consumed in Query which is designed as per the layout and filter requirements of the business scenario. Each view has a Data Category setting which defines its role, such as query or dimension. In addition to the Data Category, each view is defined with a View Type to further define its role. View types include:

Consumption Views - A view (dimensions, cube, query) that is ready to be consumed directly by applications or analytical tools. (SAP standard views use the name prefix C_).

Composite Views - Can only read other views to form cubes or dimensions, and cannot read tables directly. Cannot be consumed directly by applications or analytical tools. SAP standard views use the name prefix I_ (this means 'Interface' view) with the view type composite setting.

Basic Views - Consume tables directly to form dimensions, cubes. Also uses the name prefix I_ with the view type basic setting

Custom CDS views can be created with the prefix 'Z' along with the above mentioned View type prefixes. Example as below:



3 Virtual Data Model - Deep Dive:

Basic Views - Basic views are typically the first layer in the CDS view layers. They define the core structure by exposing relevant fields from one or more database tables/views. It helps define relationships (joins) between tables using associations. Basic views can be reused by other CDS views or applications to ensure modularity and consistency.

Syntax: @VDM.Viewtype: #BASIC

Composite Views - A Composite View in ABAP Core Data Services (CDS) is a mid-layer view designed to combine data from one or more Basic Views or other Composite Views. Its primary purpose is to transform, enrich, and prepare data for specific business needs by applying calculations, aggregations, joins, and filters. It acts as a reusable component in layered CDS models, reducing redundancy. Optimized real-time execution using HANA's in-memory capabilities is achieved by this design. This modularity in design makes them reusable for other composite or consumption views. Business logic can be encapsulated as well to have a clear view for maintenance.

Syntax: @VDM.Viewtype: #COMPOSITE

Consumption Views - A Consumption View is the topmost layer in the hierarchy of ABAP Core Data Services (CDS) views. It is designed to prepare data specifically for end-user consumption, whether through

SAP Fiori apps, analytical dashboards, or other reporting tools. Built on top of Composite Views, a Consumption View does not add new business logic but instead formats, filters, and exposes data in a way that aligns with the needs of users. They are generally of type Dimensions, Cube, or Query. The Dimension views are for master data reports for users who would like to see the details of the possible values for any dimension. Cube view is similar to the BW Cube object which combines master data with transactional data to provide the complete set of information which can be consumed in a Query. A Query is designed as per the Report layout, Input parameters, and filters requirements as per the specific Business need. For example a Trial balance report showing a monthly trend which can be run for a single or multiple company codes.

Syntax: @VDM.Viewtype: #CONSUMPTION

Aspect	Basic View	Composite View	Consumption View
Purpose	Data extraction and modeling	Data enrichment and integration	Data presentation and consumption
Logic Complexity	Low	Moderate	Minimal
Target Audience	Developers	Developers	End-users
Use Cases	Foundation for data models	Intermediate calculations	Reporting and dashboards

4 Analytical applications: These are the applications to display and create analytical content which are based upon the virtual data model(VDM). Overview Pages, Analytical list pages, Smart Business KPIs, SAP Analytics Cloud(SAC) Stories, Analysis for Office(AO) Workbooks are a few examples of such Applications. As per the Business Requirements, the choice of the tool is made and Reports or Dashboards are created. SAP S/4HANA provides a library of ready-to-use analytical apps, such as "Accounts Payable Overview" or "Sales Order Fulfillment," for various business scenarios. Pre-configured KPIs and dashboards cover key business areas like finance, sales, procurement, and logistics, reducing the time to implement analytics. Users can personalize this content or create a custom Application or Report as per the Business need. Some of the key Applications are SAP Fiori Apps, Fiori smart business KPI modeller apps and SAP Analytics Cloud(SAC).

5 SAP Fiori apps Reference Library:

SAP has documented all pre-built Analytical apps in a library and provides an easy-to-use exploration link. This is called the SAP Fiori apps reference library. Apps are organized by user role, industry, line-of-business, and application type, making it easier to locate as per the need. New apps are continually added by SAP, and existing apps are frequently enhanced. It also offers filters for the form factor e.g., tablet, phone, desktop. The library identifies the business role needed for each app, enabling users to access the app via their SAP Fiori Launchpad.

6 Smart Business KPI:

A KPI could be any key value in the business system having strategic importance, for example, Net Sales of a Company. SAP S/4HANA embedded analytics includes many predefined KPIs that cover all areas of a business. It is possible to create your own custom KPIs if the predefined ones are not suitable using the KPI Modeler Apps. A KPI acts as an abstract entity based on which the more concrete Evaluations are defined.

An evaluation can have several tile representations. Tile can have various representations and is the first entry point for business users. A click on a tile would lead to the drill-down application configured against the tiles' evaluation.

7 SAP Analytics Cloud:

SAP Analytics Cloud (SAC) is a cloud-based, all-in-one analytics platform that integrates Business Intelligence (BI), Planning, and Predictive Analytics. It enables users to visualize data, build dashboards, forecast trends, and make data-driven decisions in real-time. SAC is designed to integrate seamlessly with SAP systems, including SAP S/4HANA, making it a key tool for consuming data from the Virtual Data Model (VDM) of SAP S/4HANA Embedded Analytics. SAC users can create interactive dashboards and stories by consuming data from CDS views (Analytical Queries) within the VDM. With the Live Connection, any updates in SAP S/4HANA data are immediately reflected in SAC dashboards, enabling real-time decision-making.

Conclusion

SAP S/4HANA Embedded Analytics revolutionizes how businesses approach data-driven decision-making by providing real-time, actionable insights within transactional workflows. Their integration with SAP Fiori, pre-built content, and role-based design empower users to make informed decisions swiftly, improving operational efficiency and strategic outcomes.

Key features include:

- Live Data Access from the real-time tables of SAP S/4HANA.
- Fast Response using SAP HANA in-memory database.
- Accessible via SAP Fiori or SAP Analytics Cloud.
- Combines analytics and transactional processing seamlessly.
- Provides links to common actions within analytical applications.

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