DMM301 – Benefits and Patterns of a Logical Data Warehouse with SAP BW on SAP HANA

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Agenda

Introduction
• Diverse BI Landscapes
• Logical Data Warehousing with SAP BW 7.40 powered by SAP HANA
• System Demos

LSA++ Incremental Data Warehousing
• Simplified and Incremental Architectures
• System Demos
• Raw and Business Oriented Data Warehouse

Wrap up
• Key Takeaways
Introduction – Diverse BI Landscapes

Today’s BI landscapes consists of multiple information management approaches with different characteristics

The (Enterprise) Data Warehouse is a central component which addresses services like

- Consolidation
- Integration
- Managed (business) consistency
- Reproducibility
- Availability
- Auditability
- Reliability
- any Snapshot
- Time travel enablement
- Predictive analysis foundation
- Stable interoperability
- Maintainable business transformation complexity
- Handle resource limitations
- …
Introduction – the Logical Data Warehouse
Service level requirements driven

Logical Data Warehousing describes architectures that
- combine these approaches under a reusable layer of information models
- choose or change the approach according to service levels or use case characteristics
Gartner and LDW – Logical Data Warehouse
The role of reusable metadata for flexibility and simplicity

The LDW consists primarily of services and metadata. The metadata must be **reusable** across all classes of services operating. For example,

- as data virtualization jobs begin to specify recurring relationships in data, **moving the virtual data toward** a high-performance **repository** rendering.
- or, if a distributed process emerges as commonly used over time, the same metadata should be **usable to convert** the process into a data integration job and move the results **to tables** …**in a repository**

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**Reusable Metadata**
- The metadata must be **reusable** across all classes of services
- Same metadata should be **usable**
- **to move the virtual data toward** a repository
- **to convert** the process .. results **to tables** …**in a repository**

- **Repositories**
  - EDW, DMs, ODS
  - **physical consolidated**
- **Virtualization**
  - **read the data in place**
- **Distributed process**
  - managed service call to external provider
Logical Data Warehousing with SAP BW on SAP HANA

Reusable, flexible Metadata Layer in SAP BW
- Open ODS View to adapt tables/views in SAP HANA and external sources
- CompositeProvider to build sophisticated virtual data marts
- Advanced DataStore Object as central repository object

SAP HANA Smart data access
- SAP HANA’s federation capability
- Provides transparent SQL access to, and across a variety of database systems
BW Open ODS Views and the LDW
Decoupling persistent data from semantics & associations modeling

**InfoObject-based**
- Query, CompositeProvider

**Field-based**
- Query, CompositeProvider

### Functions Modeling
- agile combine & associate

### Semantics and Associations Modeling on persistent data
- Master, text, dimension
- Transaction, fact
- Propagator, Corporate memory
- Characteristic, key-figure
- Key-figure behaviour
- ...

### Persistent Data Modeling
- 3NF, denormalized, data vault..
- Key, Attributes,
- Delta criteria
- Partitioning
- History handling
- Consistency handling

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**Tight coupling**
- of semantics and associations modeling with persistent data model

**De-coupling**
- of semantics and associations modeling from persistent data model

**InfoObject-based**

**Field-based**

- Master Open ODS Views
- Fact Open ODS View

- Fields, ADSOs
- in place data Table, DB-View
System Demo Part 1
Address data outside of the BW repository

**Virtualized Access**
- Data Mart / parts of Data Mart residing in an external database
- Adapt model via Open ODS Views
- Run query on Open ODS Views
Moving to SAP BW

- Enrich Open ODS View with BW semantics
- Generate Advanced DSO from Open ODS View
- Re-run query on Open ODS Views
Recap

Simplification
- Initial steps with SAP BW become really simple
- Ready to use advanced SAP BW functionality
  - OLAP
  - Data flow, data management, …
  - Security/authorizations, …

Incremental („bottom up“) modelling approach
- start with given structures
- work with data interactively
- enrich and extend iteratively
LSA++

Incremental Data Warehousing

How does this impact flexibility and agility of the Data Warehouse?
Different design approaches of landscape components lead to data & meta data movements/redundancy

Missing alignment possibilities lead to islands & inconsistencies

- DWH-model based BI
- High design governance, focus on
  - Consistency, history
  - Cross process integration
  - Common
    - Coded data
    - Master data/dimensions
    - Interpretation of data

- OLTP-model based BI
- Low design governance, focus on
  - Flexibility, Independence
  - Virtualization/low cost BI
  - Most recent/actual data

Operational/Local BI
Source system - Open ODS
Modeling and BI Architecture
There is no ‘neither .. nor’ - Reconciling Top-Down and Bottom-Up Approaches

Top Down modeling

Business/ Domain Integrated BI (E) DWH

- DWH-model based BI
- High design governance, focus on
  - Consistency, history
  - Cross process integration
- Common
  - Coded data
  - Master data/ dimensions
  - Interpretation of data

Different design approaches of landscape components lead to data movements/ redundancy

Bottom Up modeling

Service level requirements ⇒ evolve Local/ Operational BI to DWH where it shows value

- OLTP-model based BI
- Low design governance, focus on
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  - Virtualization / low cost BI
  - Most recent/ actual data

Service level requirements ⇒ leverage bottom up modeling flexibility where it shows value

Operational / Local BI
Source system - Open ODS

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There is no ‘neither .. nor’ - Reconciling Top-Down and Bottom-Up Approaches

Top Down modeling

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Bottom Up modeling

- OLTP-model based BI
- Low design governance, focus on
  - Flexibility, Independency
  - Virtualization/low cost BI
  - Most recent/actual data

Different design approaches lead to data movements/redundancy/missing alignment possibilities lead to islands & inconsistencies

Service level requirements ⇒ leverage bottom up modeling flexibility where it shows value

Service level requirements ⇒ evolve Local/Operational BI to DWH where it shows value

Operational/Local BI Source system - Open ODS
Simplified and Incremental Architectures

Reusable meta data - Virtual Data Marts – fact / dimension views

Raw – Domain related DWH

Open ODS

Historic

Transformed - Business Integrated DWH

Persistant Data Marts DWH

Business/ Service Level Requirements

Source

Most recent

Actual

most recent
System Demo Part 1

From ODS to Raw Data Warehouse

- Data flow to historize ODS data
- Extend Open ODS View
System Demo Part 2

Extending the Business Integrated Data Warehouse

- Extend CompositeProvider with attributes from Open ODS View
Raw and Business Integrated Data Warehouse

Governed by Sources
- Structures, Changes, Scheduling
- Domain specific entities, some degree of reuse
- “bottom up“

Governed by Business Requirements
- Harmonized, consolidated, agreed-on structures
- Central, highly reusable entities
- “top down“
Wrap Up
Key Takeaways

SAP BW 7.40 powered by SAP HANA

- Supports the Logical Data Warehouse paradigm
- Provides lean and agile mechanisms to integrate and leverage external data
- LSA++ continues to evolve to provide more services on source level data
UPCOMING:
openSAP SAP Business Warehouse powered by SAP HANA course

• 4 Weeks of videos, demonstrations and explanation focused on SAP BW 7.4 powered by SAP HANA

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