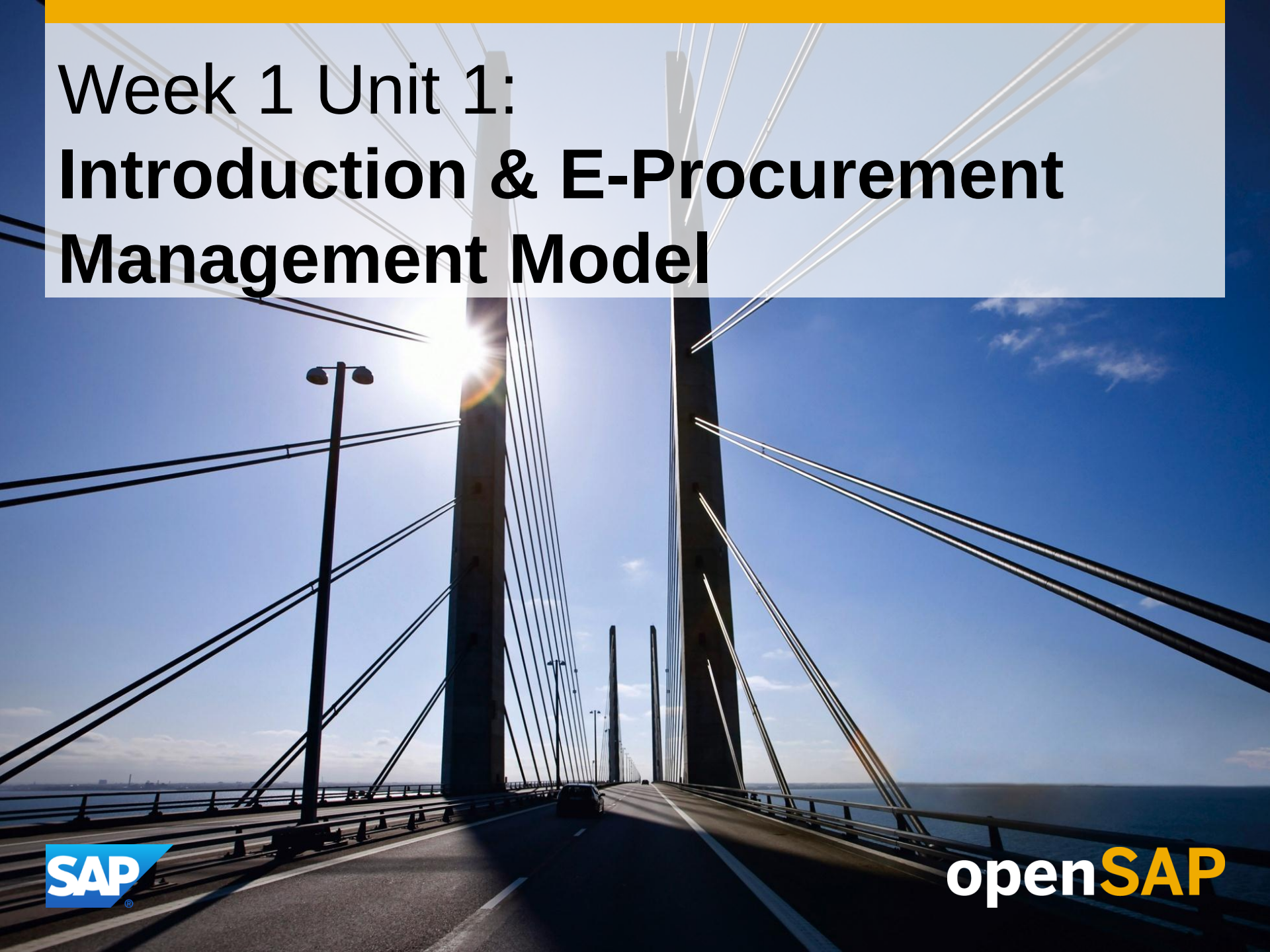
Week 1 Unit 1:
Introduction & E-Procurement Management Model



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Introduction & E-Procurement Management Model

Covered in This Unit

Content

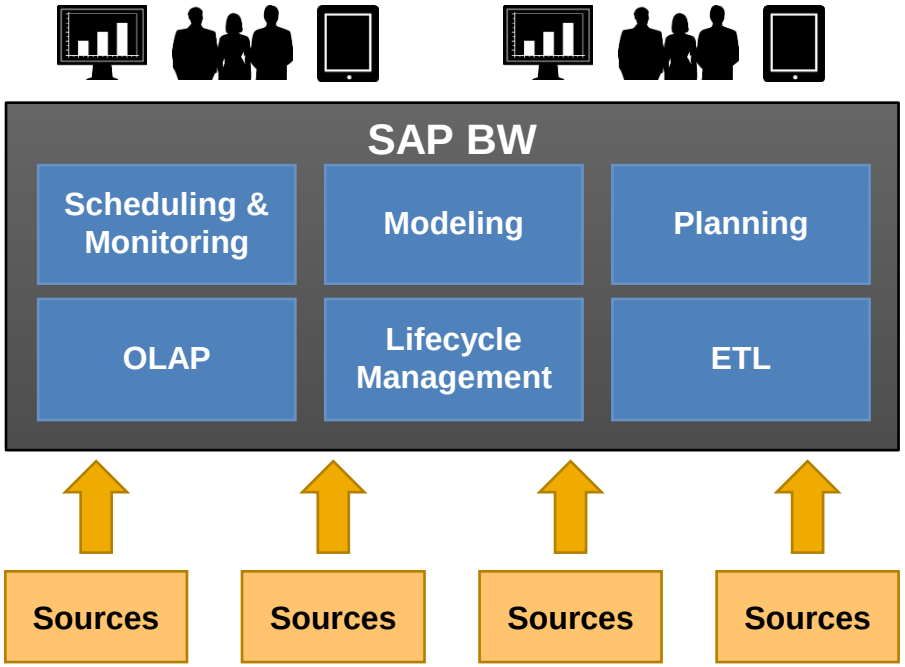
- Introduction
- What is SAP BW?
- Course overview
- EPM model overview
- Get your cloud instance

Introduction & E-Procurement Management Model

What is SAP BW?

General Introduction

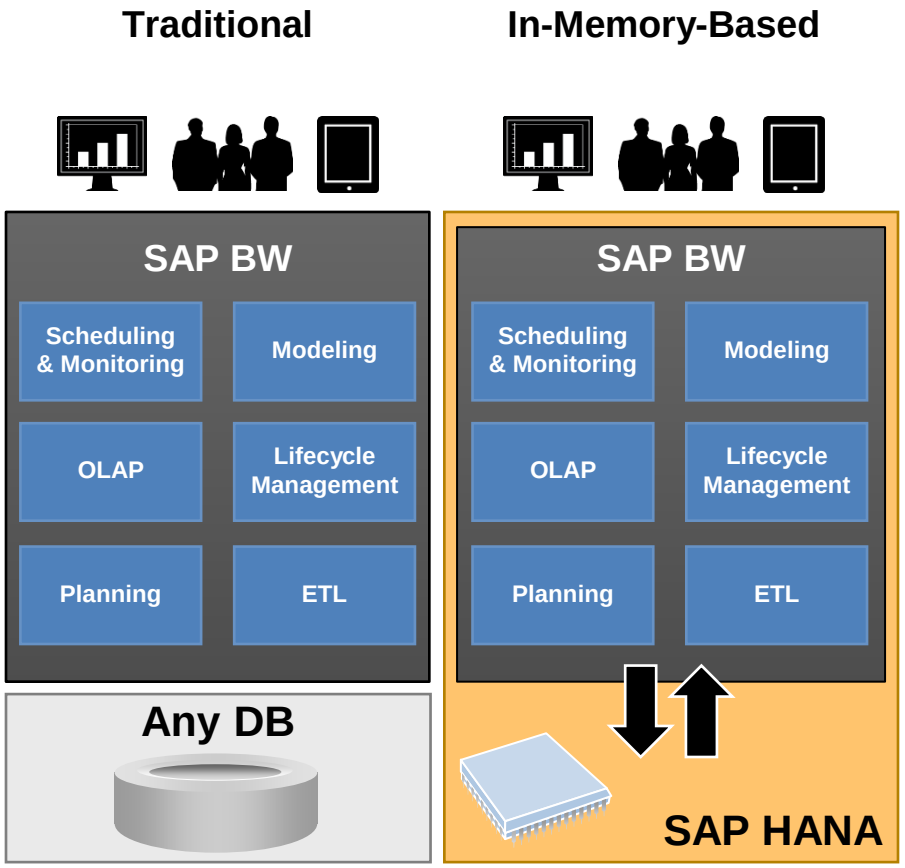
- SAP BW is SAP's enterprise data warehousing application
- Adds data warehousing services on top of a database (such as SAP HANA)
- Strong installed base
- One of the first applications powered by SAP HANA



Introduction & E-Procurement Management Model

SAP BW powered by SAP HANA – Smarter, Simpler, More Efficient

- Alignment of database and application server to enable push-down of functionalities
- SAP HANA takes over processing of major data warehousing tasks
- Excellent performance in reporting and data loading
- Simplifies, increases agility, reduces complexity, and combines the strengths of SAP BW and SAP HANA



Introduction & E-Procurement Management Model

Course Overview

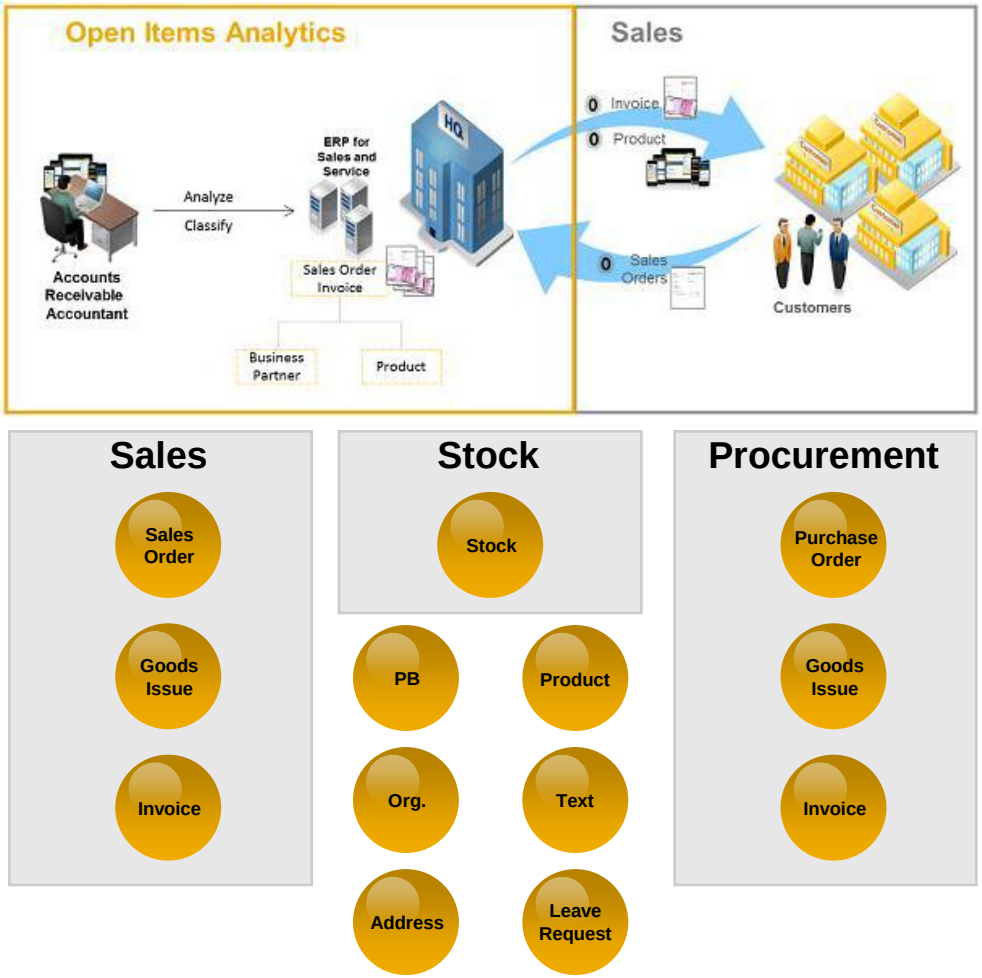
1. **SAP BW powered by SAP HANA – Intro**
2. **Data Integration & Management**
3. **Data Consumption & Analysis**
4. **Planning & Lifecycle Management**

Introduction & E-Procurement Management Model

Overview of EPM Scenario

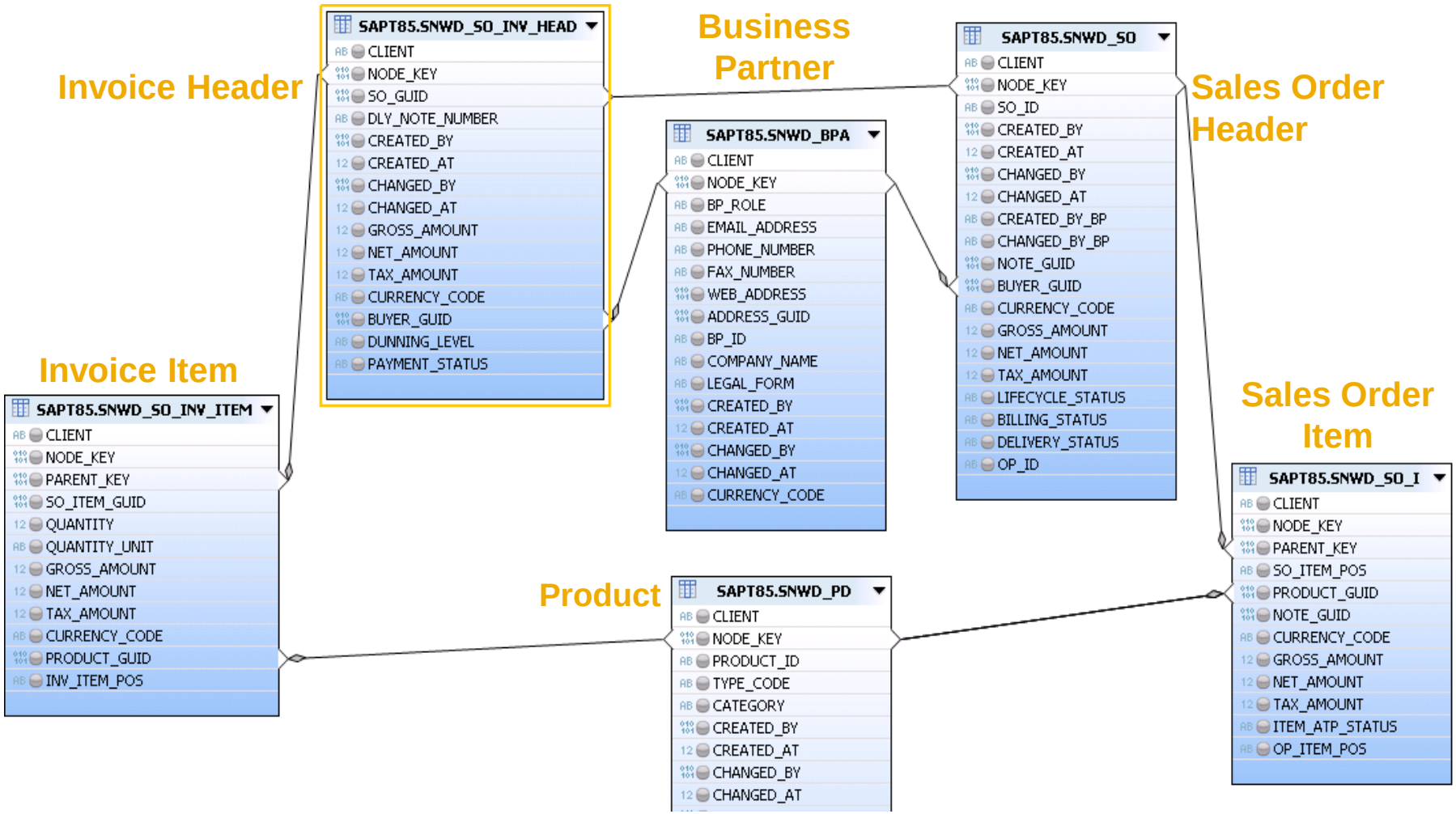
SAP NetWeaver EPM Model

- A demo application, covering a sales business scenario
- Fictitious company ITeLO sells hardware
- ITelO is a global player with several subsidiaries and locations world wide selling its products
- EPM model includes several business objects to encapsulate the business logic



Introduction & E-Procurement Management Model

Overview of EPM Scenario

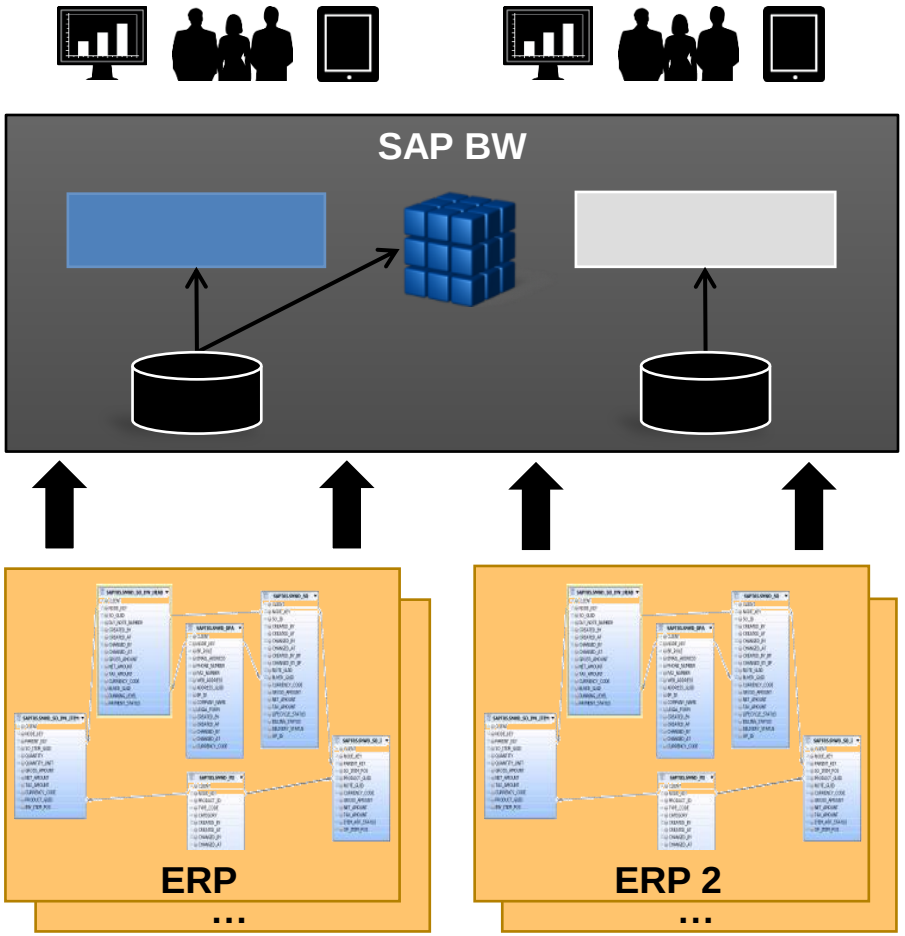


Introduction & E-Procurement Management Model

Course Scenario & Objectives

What you will learn in this course

- You will learn how to integrate data and create data models in SAP BW powered by SAP HANA
- Technical demonstrations will show the strength in the core data warehousing areas
- The focus is on new SAP BW 7.4 powered by SAP HANA concepts and features

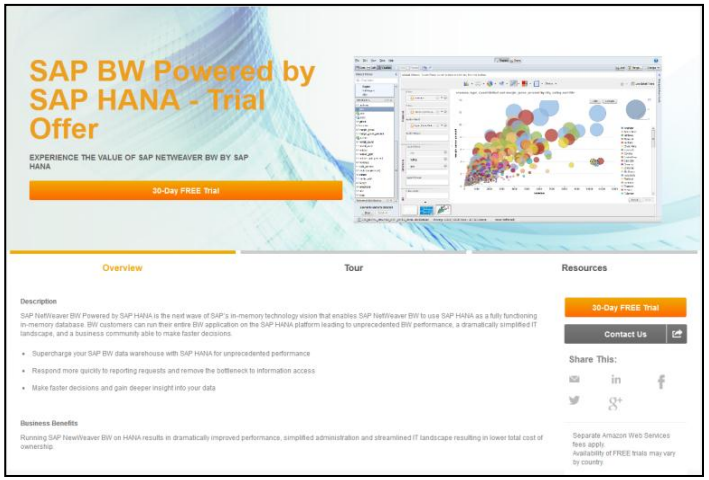


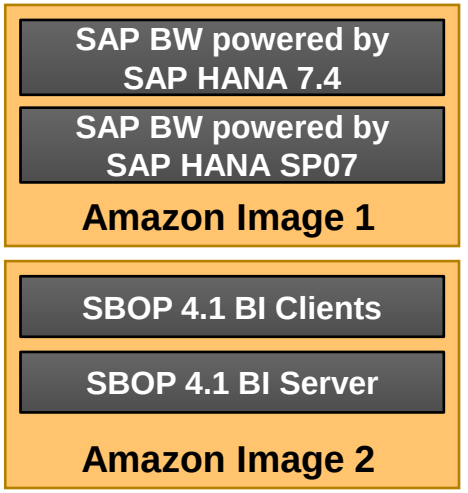
Introduction & E-Procurement Management Model

SAP BW powered by SAP HANA Trial

Get hands-on system experience and learn more during the course

- Create your own free SAP HANA cloud instance for 30 days (not for production usage)
- Available on the SAP HANA Marketplace
- Offering uses Amazon Web Services, which is charged hourly
- Consists of an SAP BW powered by SAP HANA and an SAP BusinessObjects installation





Introduction & E-Procurement Management Model

What You've Learned in This Unit

Key takeaways

- EPM model is the foundation of the data models shown in this course – you can reuse it for your own testing activities
- The course will explain briefly the main concepts of SAP BW and focus on the latest innovations with SAP BW 7.4 and SAP HANA
- You can get your own SAP BW in the SAP HANA Cloud trial landscape

Thank you

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Week 1 Unit 2:
Enterprise Data Warehousing – Why?

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Enterprise Data Warehousing – Why?

Covered in This Unit

Content

- Context of a data warehouse
- Characteristics & tasks
- Different approaches for implementation

Enterprise Data Warehousing – Why?

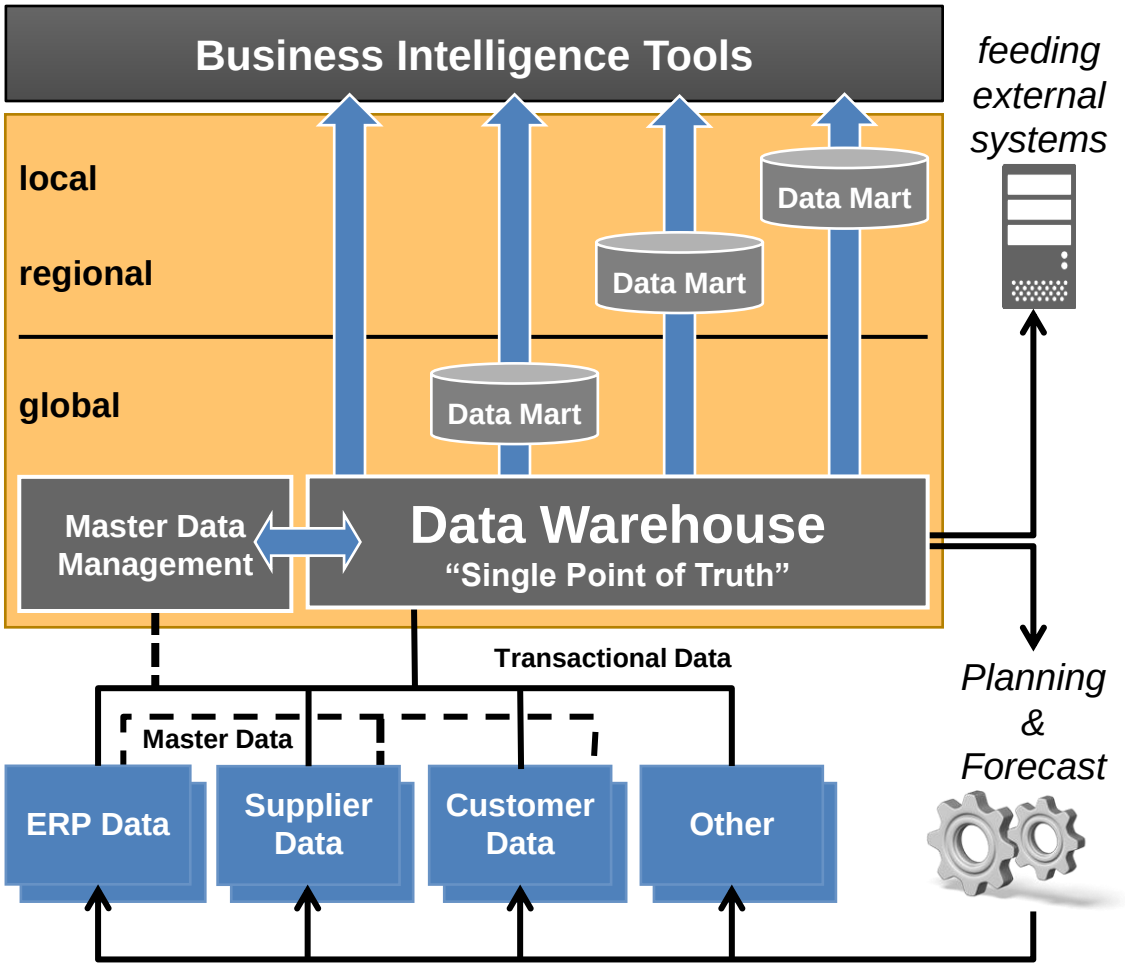
Example of a Customer Enterprise Data Warehousing Landscape

EDW – Characteristics:

- Consolidates data across the enterprise
- Standardized data model
- Supports decision making

Main Tasks of a Data Warehouse:

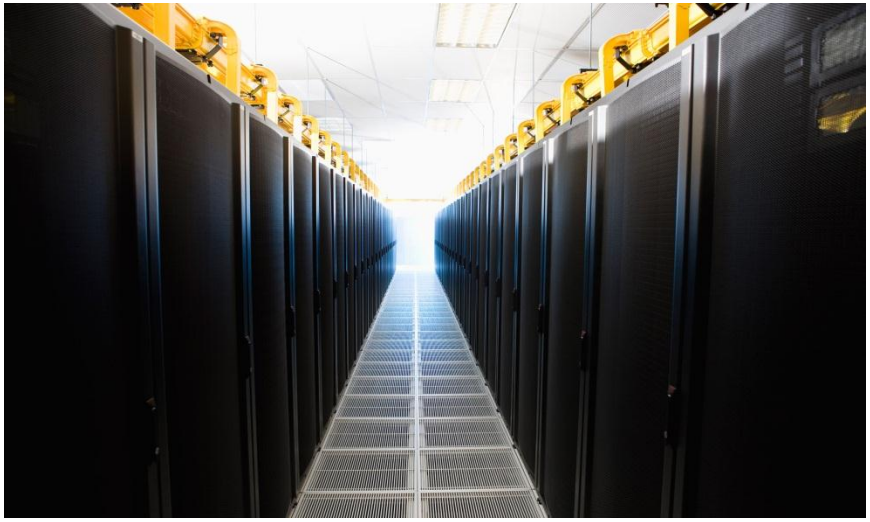
- Define common semantics
- Harmonize data values
- Establish a ‘single version of truth’
- Provide a single, comprehensive source of current and historical information



Enterprise Data Warehousing – Why?
Definition

Different definitions – one common goal

- The data warehouse is a subject-oriented, integrated, time-variant, non-volatile collection of data used to support the strategic decision-making process for the enterprise.
  It is the central point of data integration for business intelligence and is the source of data for the data marts, delivering a common view of enterprise data. (Bill Inmon)
- A data warehouse is a copy of transaction data specifically structured for query and analysis.
  It is the conglomerate of all data marts within the enterprise. Information is always stored in the dimensional model. (Ralph Kimball)



Enterprise Data Warehousing – Why?

Different Approaches, Same Goal

Using an integrated EDW application

- Model-driven pre-packaged data warehouse application as a central component
- Prebuilt information models and process content
- Out-of-the-box tool set

Custom-built enterprise data warehouse

- Loosely coupled orchestration tools
- Higher efforts for development and maintenance
- High flexibility to build custom data models and processes with little enforced governance
- Open environment to easily import industry models

EDWs require a database plus EDW orchestration tools

Enterprise Data Warehousing – Why?

What You've Learned in This Unit

Key takeaways

- Enterprise data warehousing helps to harmonize and consolidate data from many sources as the single point of truth
- Within the data warehouse, data is mapped and transformed to a defined corporate model
- Data warehousing supports decision making with current and historic data for analysis
- EDW can be custom built or supported by tools and applications

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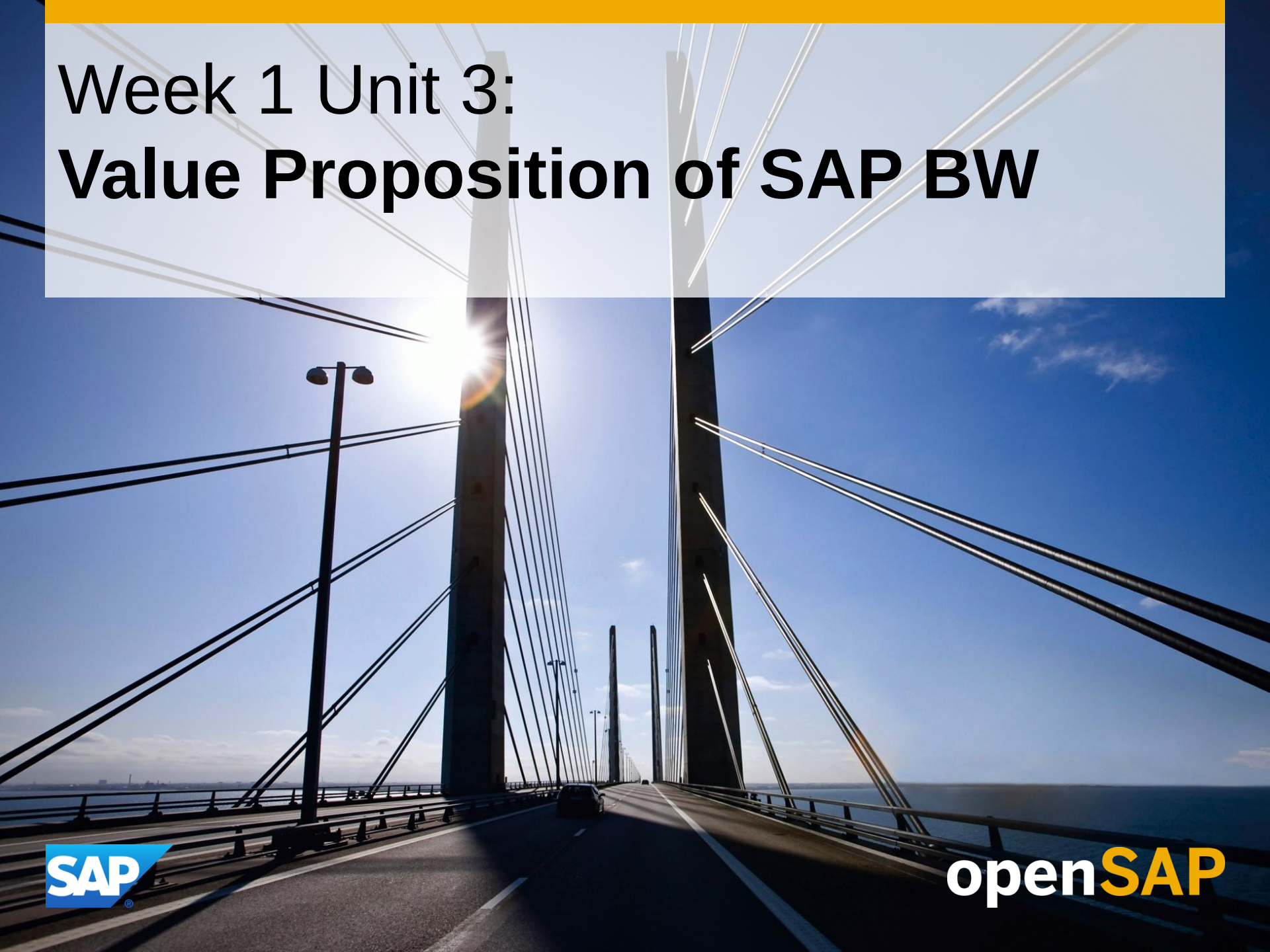
Week 1 Unit 3:
Value Proposition of SAP BW



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Value Proposition of SAP BW

Covered in This Unit

Content

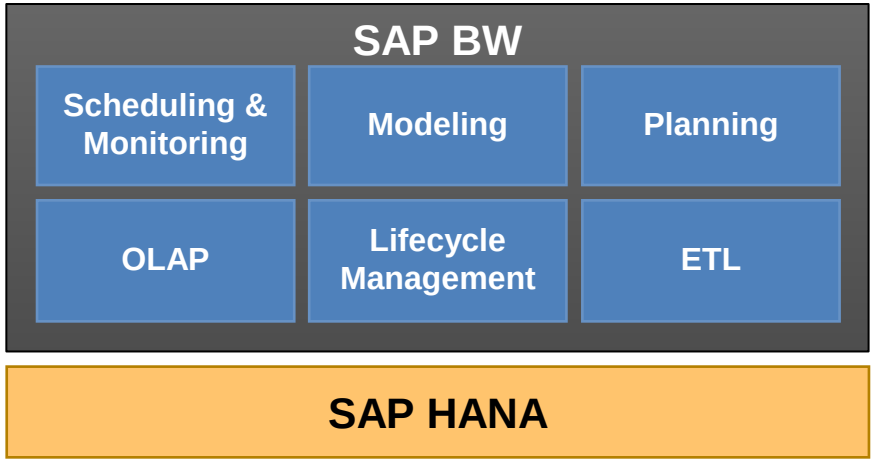
- SAP BW – an Enterprise Data Warehouse Application
- Services by SAP BW
- Examples

Value Proposition of SAP BW

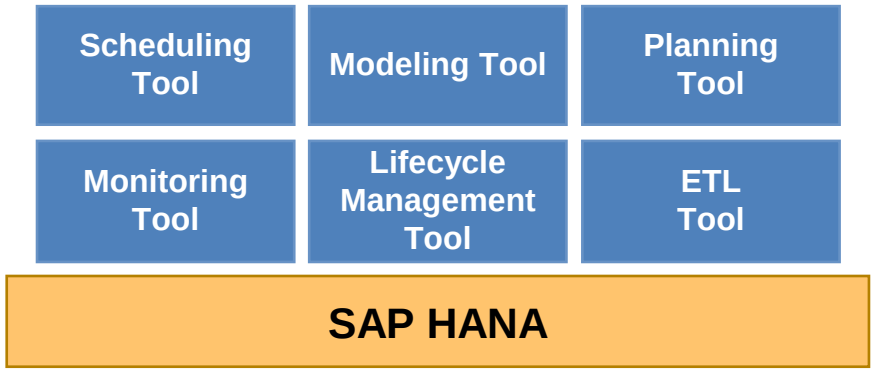
SAP BW – an Enterprise Data Warehouse Application

Enterprise Data Warehouse (EDW) = Database + DWH Services

- **SAP BW as an EDW application** offering integrated data warehousing services
- Example: No additional ETL, modelling, etc. tools necessary; functionalities are managed by inbuilt SAP BW processes

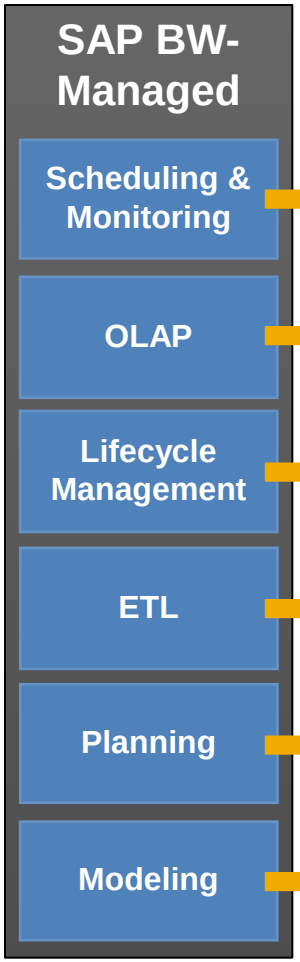


- **Database driven approaches** require several tools to fulfill the necessary tasks
- A combination of tools (such as best of breed) used to build the data warehouse



Value Proposition of SAP BW

SAP BW – Services Summary



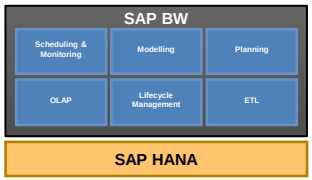
SAP BW – Integrated Data Warehousing Stack

- **Scheduling & Monitoring** → Sophisticated security, authorization handling, integrated data process and error monitoring, scheduling framework for all DWH processes
- **OLAP** → Rich set of analytic functions supporting closed loop business intelligence analysis, deep stack integration of OLAP functionalities
- **Lifecycle Management** → Sophisticated lifecycle concepts at data, metadata, and system level, integrated data aging mechanisms with consistent, optimized data management
- **ETL** → Out-of-the-box data integration for a variety of external sources, built-in data transformation and quality functions, optimal integration with SAP ERP
- **Planning** → Integrated business planning processes with a variety of ready-to-use planning functions
- **Modeling** → Modeling environment based on predefined semantics and modeling patterns, easy-to-use business content, concepts for Big Data volumes

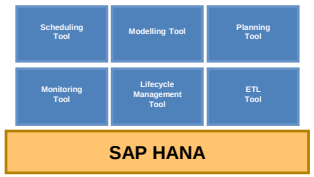
Value Proposition of SAP BW

SAP BW – Services Example: Business Semantic Modeling

SAP BW

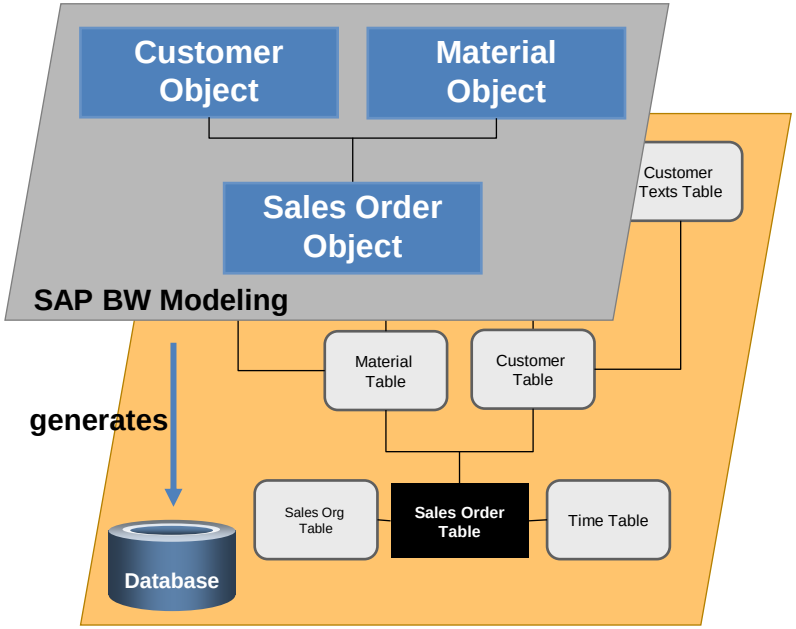


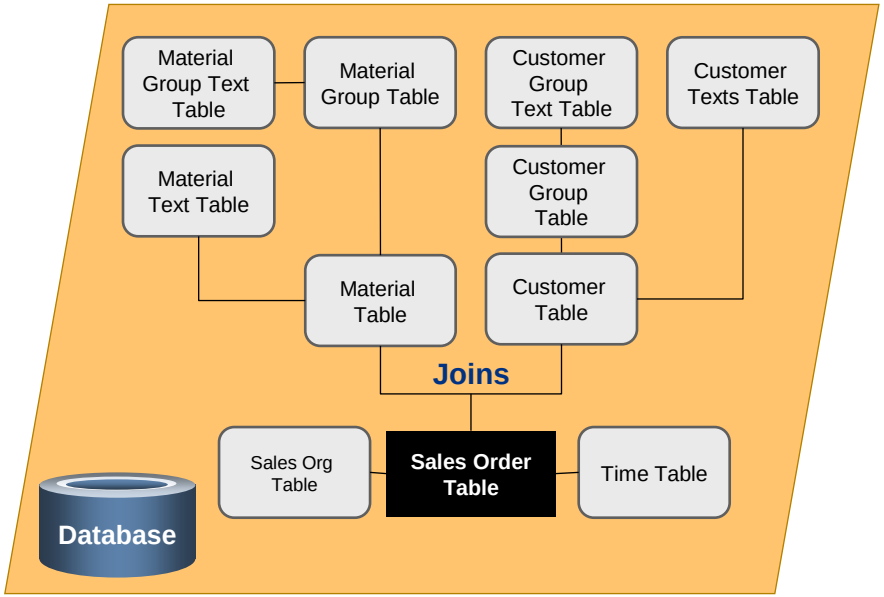
Database



Business oriented modeling through platform-neutral EDW semantics instead of technical descriptions

Some functionality provided in ETL tool; modeling of entities manually in database or modeling tools

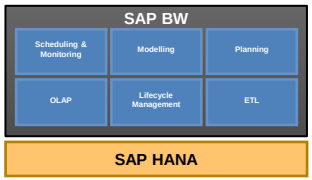




Value Proposition of SAP BW

SAP BW – Services Example: Delta Management

SAP BW



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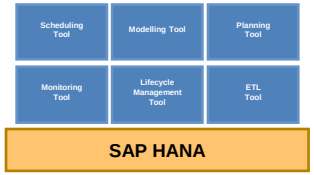


Automated delta management handling during data flow

1	29/08/2012	1000

contract_id	Date	Value
1	28/08/2012	100

Alternative 1

contract_id	Date	Value
~~1~~	~~28/08/2012~~	~~100~~
1	29/08/2012	1000

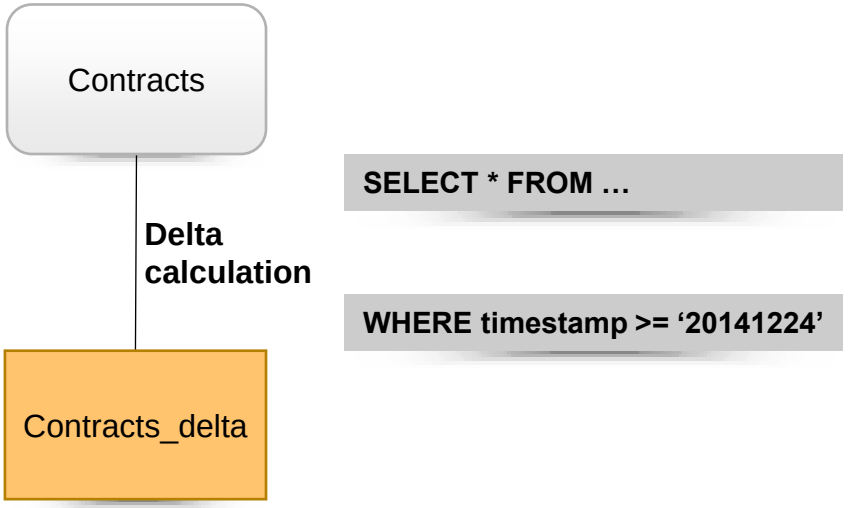
Alternative 2

contract_id	Date	Value
1	28/08/2012	100
1	28/08/2012	-100
1	29/08/2012	1000

SAP BW Modeling

Each entity with key 'measures' will need to define a 'delta' table

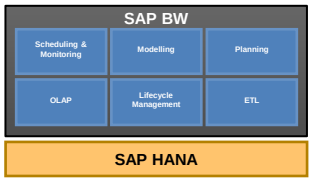
- Delta handling process needs to be implemented manually in ETL code / tool, for example, based on timestamp



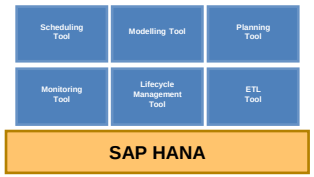
Value Proposition of SAP BW

SAP BW – Services Example: OLAP Functionalities

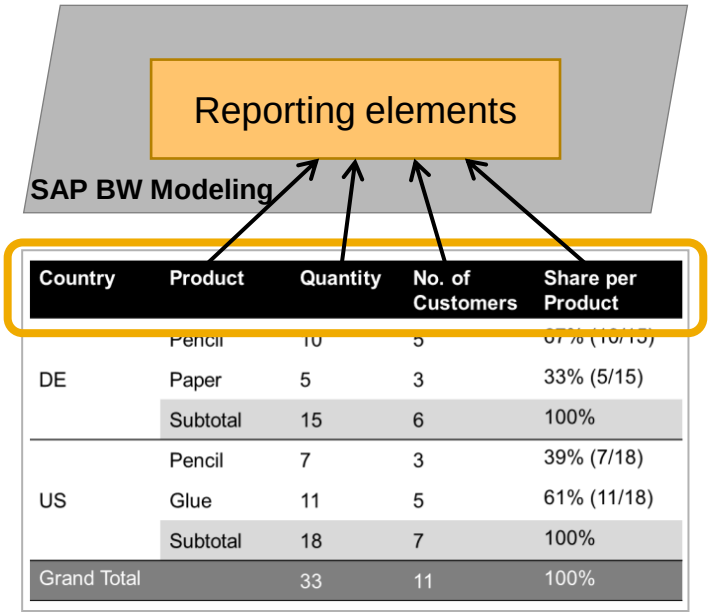
SAP BW



Database



Build reports with a variety of OLAP-rich functions on an object model level



Country	Product	Quantity	No. of Customers	Share per Product
	Pencil	10	5	67% (10/15)
DE	Paper	5	3	33% (5/15)
	Subtotal	15	6	100%
	Pencil	7	3	39% (7/18)
US	Glue	11	5	61% (11/18)
	Subtotal	18	7	100%
Grand Total		33	11	100%

Complex aggregations have to be defined in SQL statements or in an additional BI tool

```
SELECT Country, Product, Customer, SUM(Quantity), 1
FROM SalesData
GROUP BY Country, Product, Customer
HAVING SUM(Quantity) > 50000
```

Value Proposition of SAP BW

What You've Learned in This Unit

Key takeaways

- SAP BW offers integrated out-of-the-box services for data warehousing
- SAP BW offers template and object-based modeling approaches
- Database approaches leverage different tools for these services
- The combination of SAP BW and SAP HANA allows you to combine both approaches

Thank you

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Week 1 Unit 4:
Basics & Building Blocks

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Basics & Building Blocks

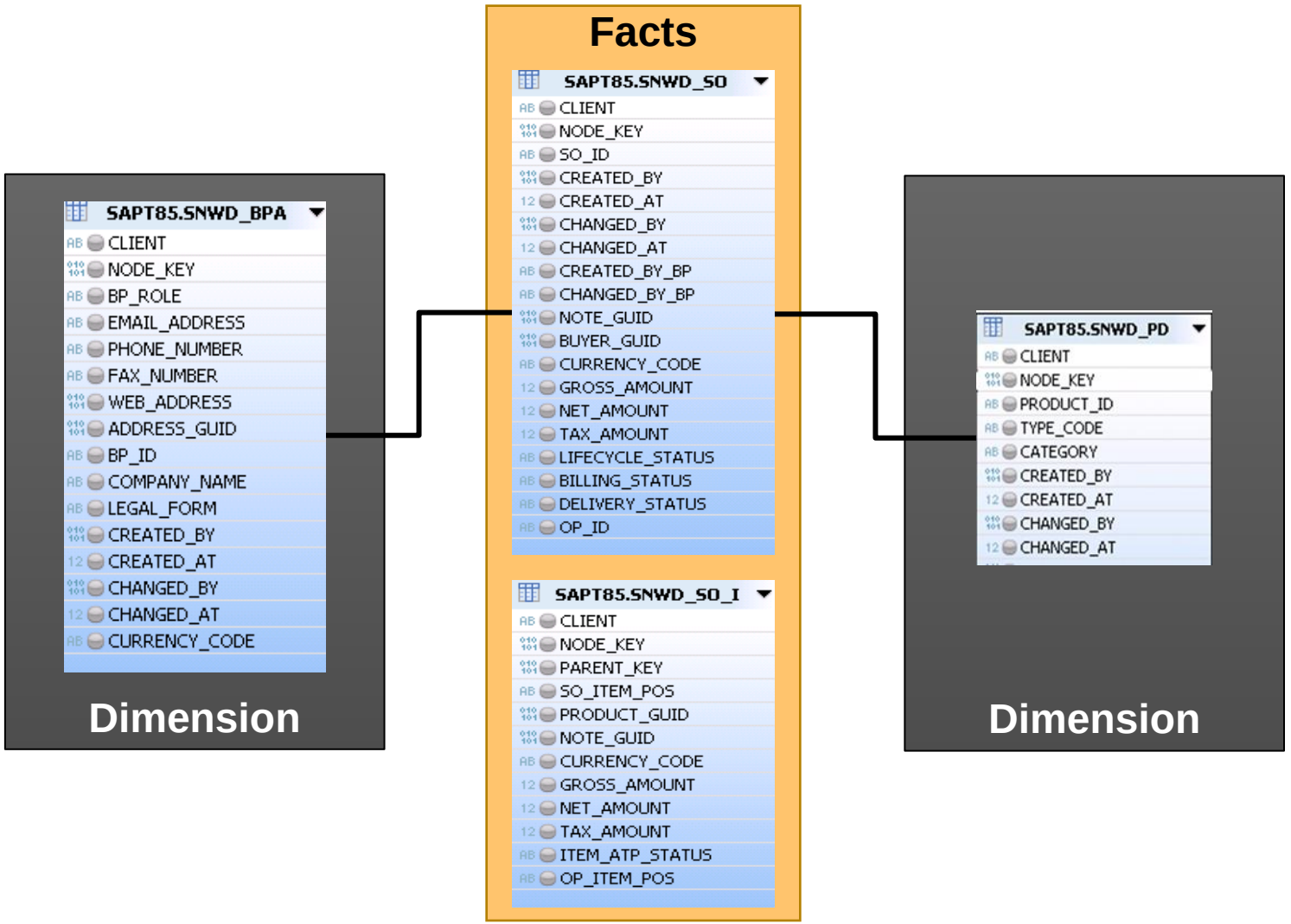
Covered in This Unit

Content

- A multidimensional model
- Build such models in SAP BW

Basics & Building Blocks

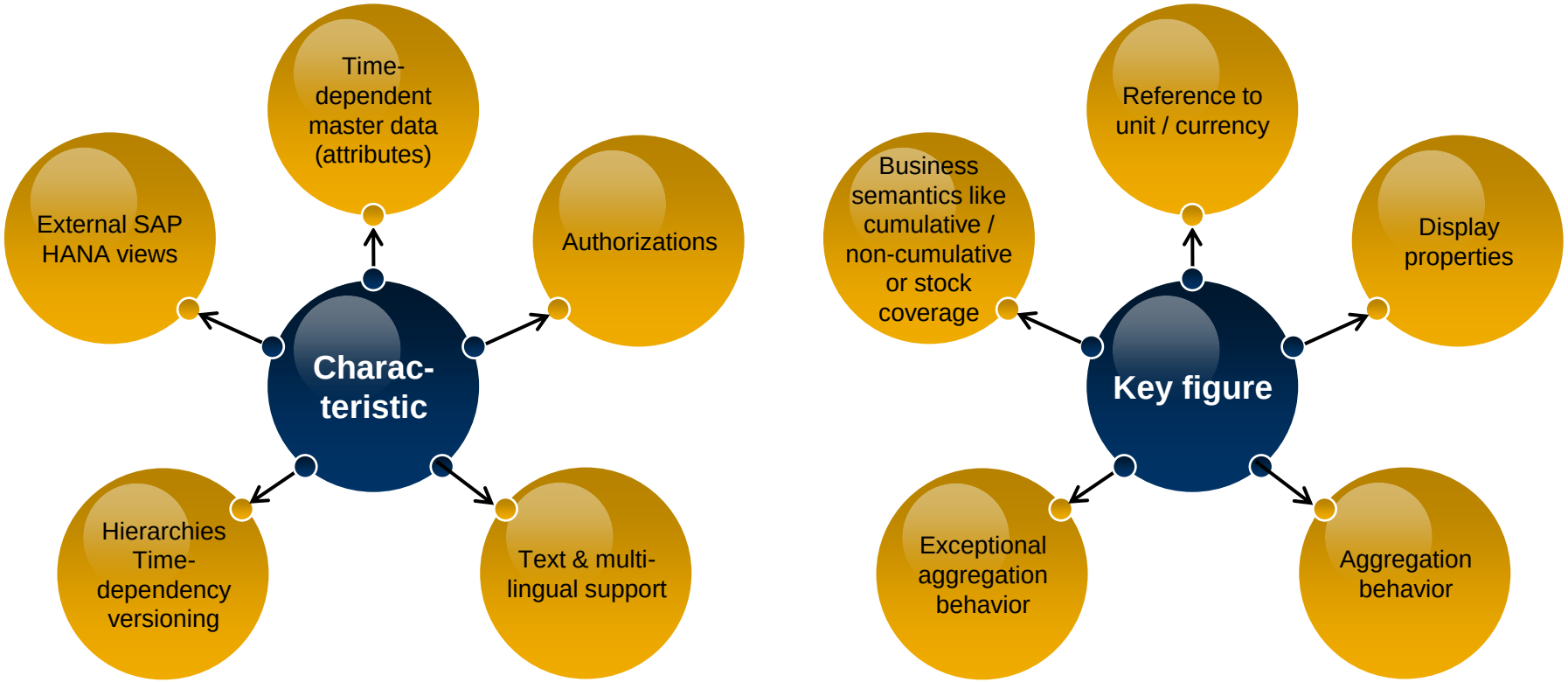
A Multidimensional Model



Basics & Building Blocks

InfoObjects

InfoObjects are the smallest building blocks in SAP BW

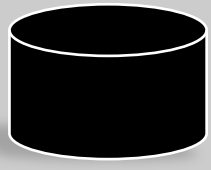


Basics & Building Blocks

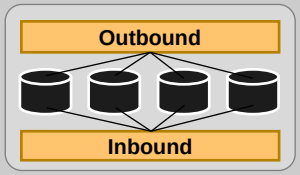
Most Important InfoProvider with SAP BW 7.4 powered by SAP HANA

InfoProviders are the data containers / virtual views in SAP BW

Objects with Persistency:



DataStore Object



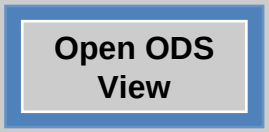
Semantically Partitioned Object

InfoCube

Not the main focus with SAP BW 7.4:

HybridProvider, InfoCube

Objects Without Persistency:



OpenODS View

Composite Provider

Multi-Provider

SAP HANA Models

SAP HANA Table/View

Not the main focus with SAP BW 7.4:

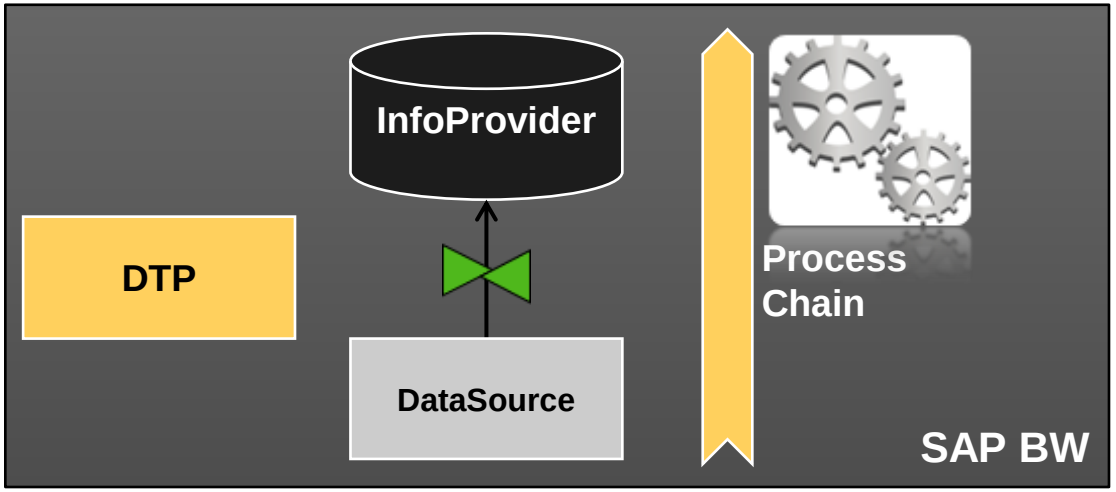
InfoSet, TransientProvider, VirtualProvider, MultiProvider

Basics & Building Blocks

Data Flows in SAP BW

Certain data flows help to schedule data loading activities and provide features to transform the data

- **Data Transfer Process (DTP)** – triggers the data transfer between a source and target
- **Transformation** – transforms the data according to defined rules
- **DataSource** – interface object to source system representing the source data structure
- **Process Chain** – a sequence of processes that get triggered in a specified order



Basics & Building Blocks

Reporting Leverages OLAP Functions of SAP BW via the BW Query

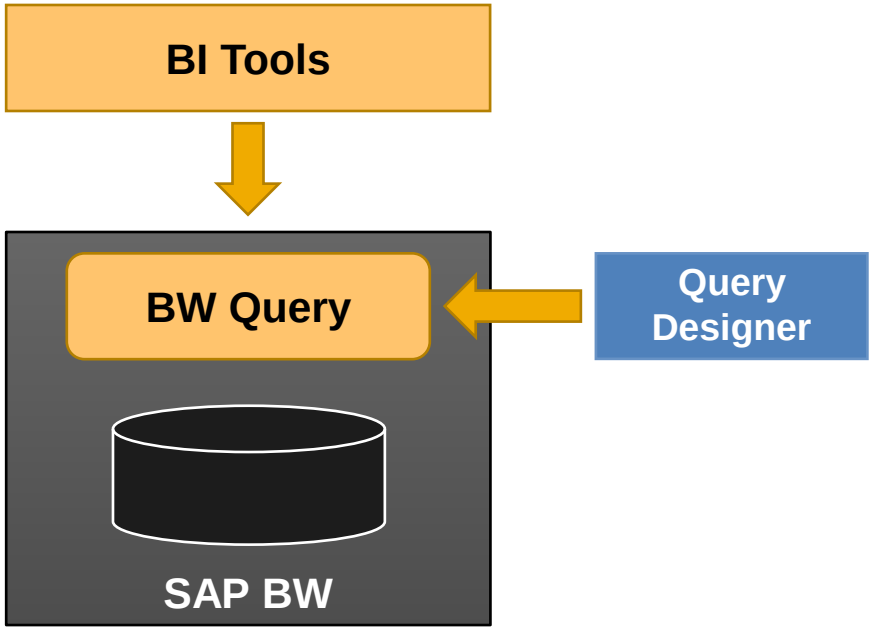
BI tools can leverage BW via certain interfaces

BW / BEx Query Designer

- is the design tool for the BW Analytic Manager

BW Query

- Offers various OLAP functions and the passivity to build a predefined report structure



Basics & Building Blocks

What You've Learned in This Unit

Key takeaways

- SAP BW helps to build analytical models via an object-driven modelling approach
- InfoProviders store the data physically or represent a virtual view for data loading and reporting
- Queries wrap the OLAP logic and provide many analytical functions

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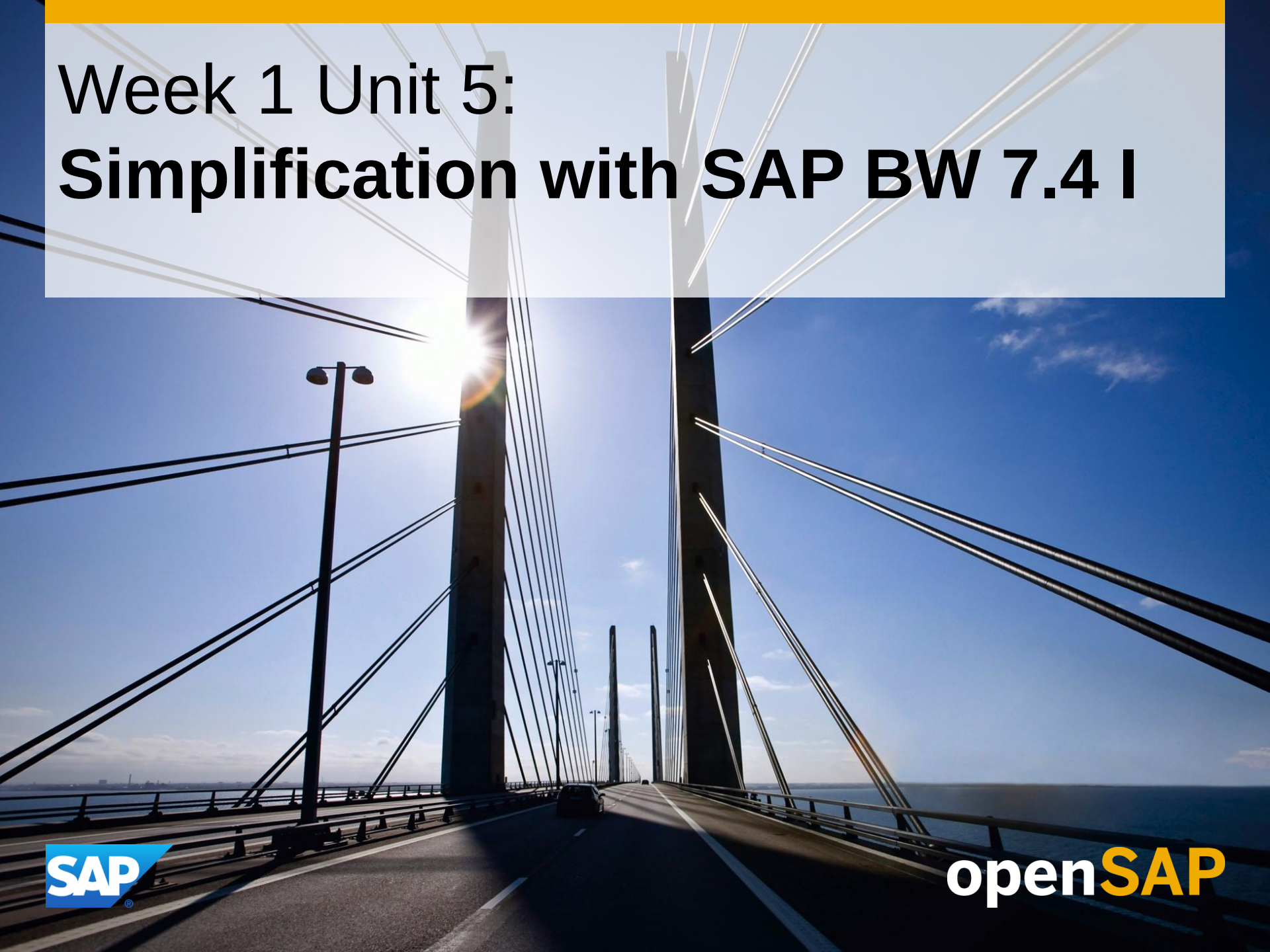
Week 1 Unit 5:
Simplification with SAP BW 7.4 I



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Simplification with SAP BW 7.4 I

Covered in This Unit

Content

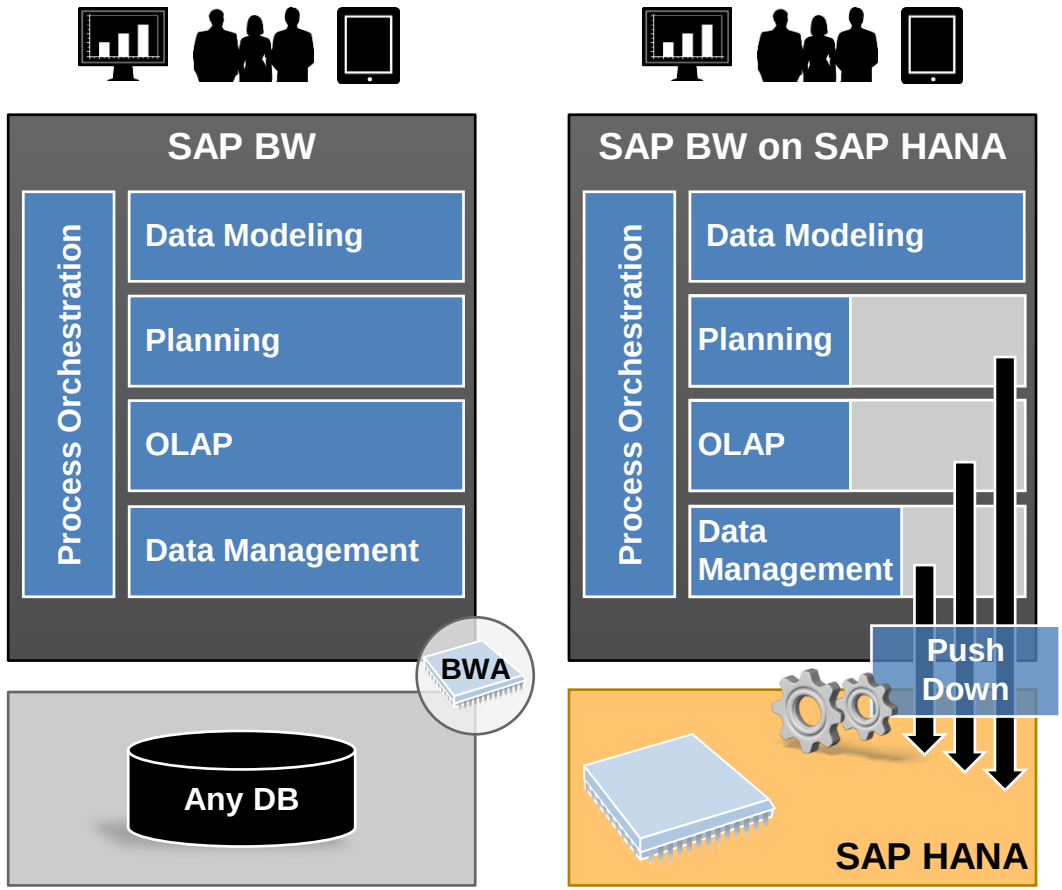
- Guiding principle with SAP HANA and SAP BW
- SAP HANA optimizations
- Experiences
- New opportunities with SAP HANA and SAP BW as platform

Simplification with SAP BW 7.4 I

What is Different with SAP BW powered by SAP HANA – Step 1

Value of SAP BW powered by SAP HANA

- Excellent query performance
- Performance boost for data load processes
- Accelerated in-memory planning capabilities
- Flexibly combine EDW with SAP HANA models
- Data persistency layers reduction
- Simplified data modeling and remodeling



Simplification with SAP BW 7.4 I

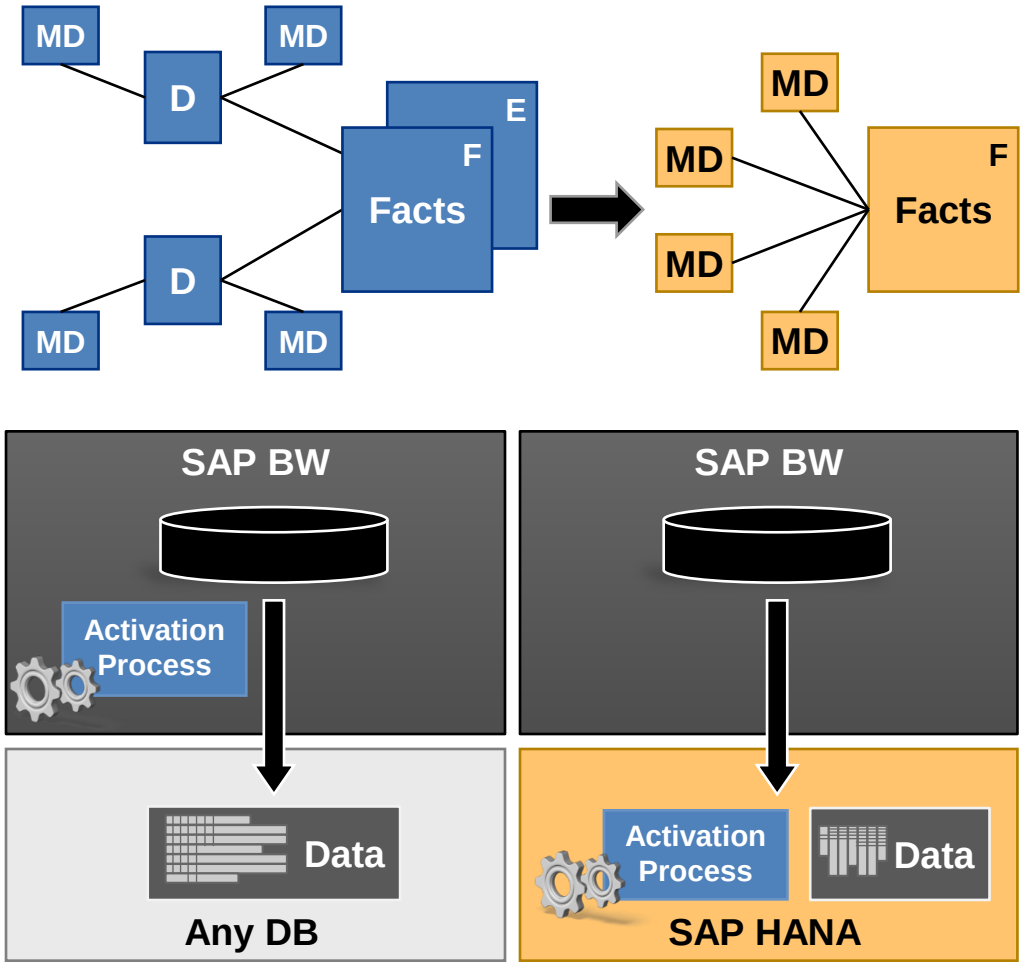
Traditional Object Optimization – Step by Step

SAP HANA-optimized InfoCube

- Converting star schema into flat data model optimized for SAP HANA
- Aggregations and dimension tables not needed anymore

SAP HANA-optimized DataStore object

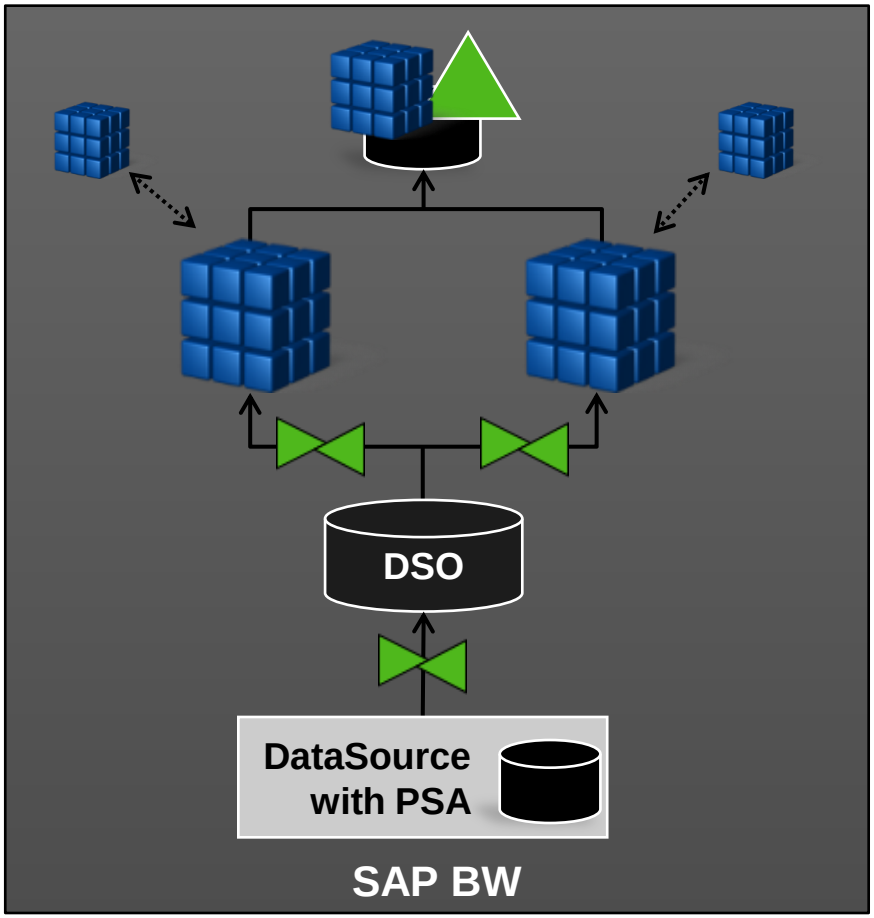
- Delta calculation implemented in SAP HANA
- Tremendous speed up for activation (factor 5-10)
- No round trips to application server needed



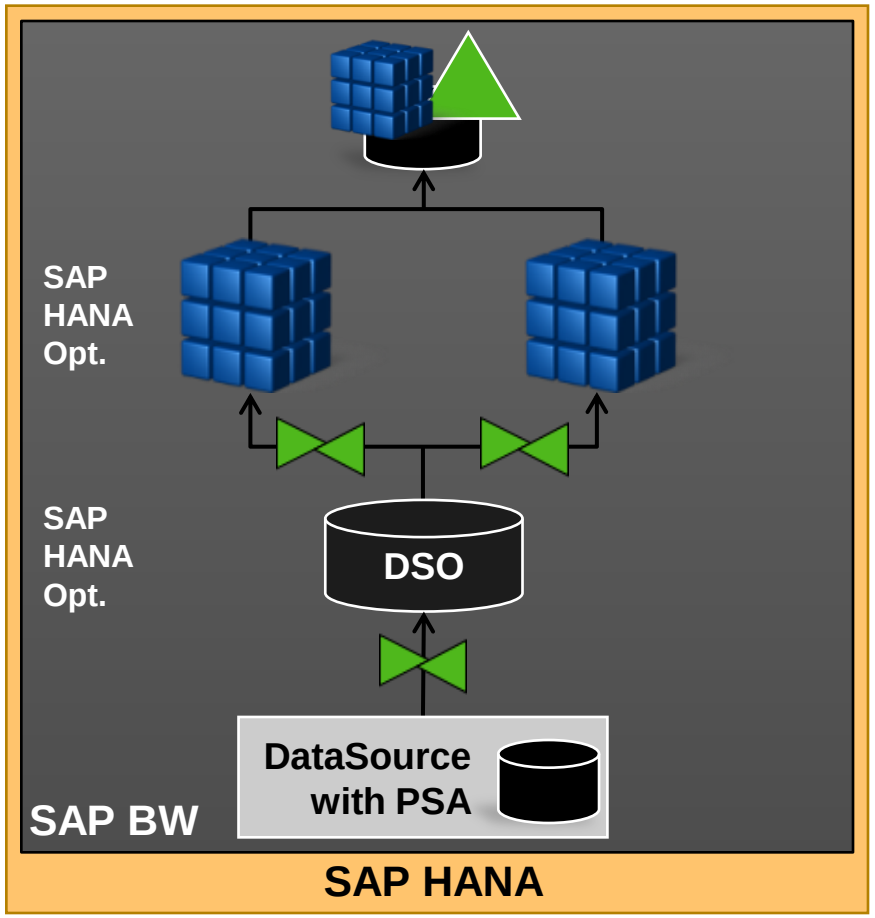
Simplification with SAP BW 7.4 I

Step 1 - Optimizing Existing Architectures

Traditional SAP BW with Any DB



SAP BW with SAP HANA opt. objects



Simplification with SAP BW 7.4 I

Some Figures

Average optimizations based on customer references

Technology Value

- **4x** Reduction in Data Size
- **3.28x** Faster DSO Load Time
- **14.2x** Faster DSO Activation Time
- **172x** Faster Queries
- **37x** Faster Data Mart Population

+

Business Value

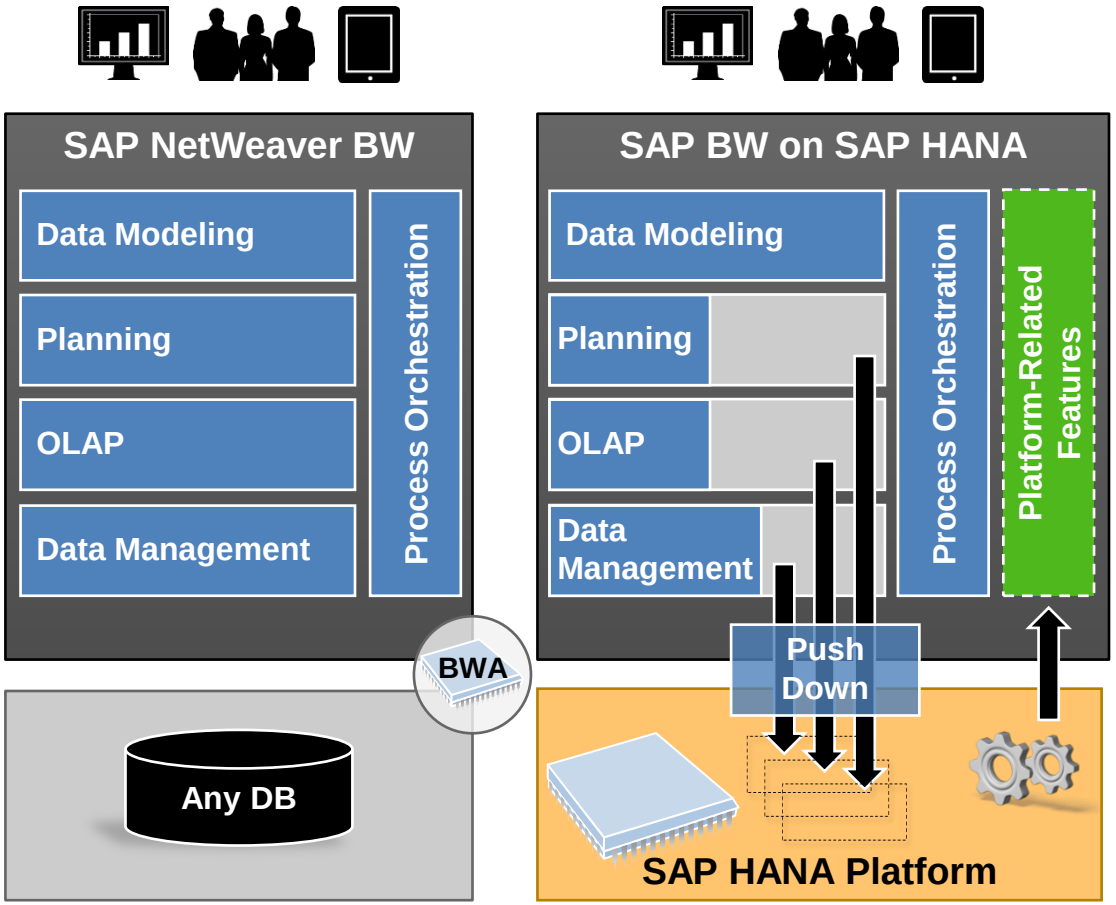
- **50%** Inventory Reduction
- **20%** Reduction in Admin and Maintenance FTEs
- **10%** Improved Budgeting & Forecasting Reporting Productivity
- **71%** Improved Integrated Business Planning

Simplification with SAP BW 7.4 I

What is Different with SAP BW powered by SAP HANA – Step 2

SAP HANA and SAP as platform

- SAP HANA offers platform functionalities that can be leveraged in SAP BW.
- For example, predictive library integration.
- New innovations and functionalities within SAP BW can be developed for SAP HANA in an optimized and deeply integrated way.



Simplification with SAP BW 7.4 I

What You've Learned in This Unit

Key takeaways

- SAP HANA underneath SAP BW accelerates data loads, reporting performance, and planning processes.
- Existing objects and processes are pushed down to SAP HANA by using SAP HANA-optimized objects (in first steps).
- New functions are available in SAP BW based on platform capabilities of SAP HANA.
- Innovations in SAP BW can be aligned and optimized directly for SAP HANA.

Thank you

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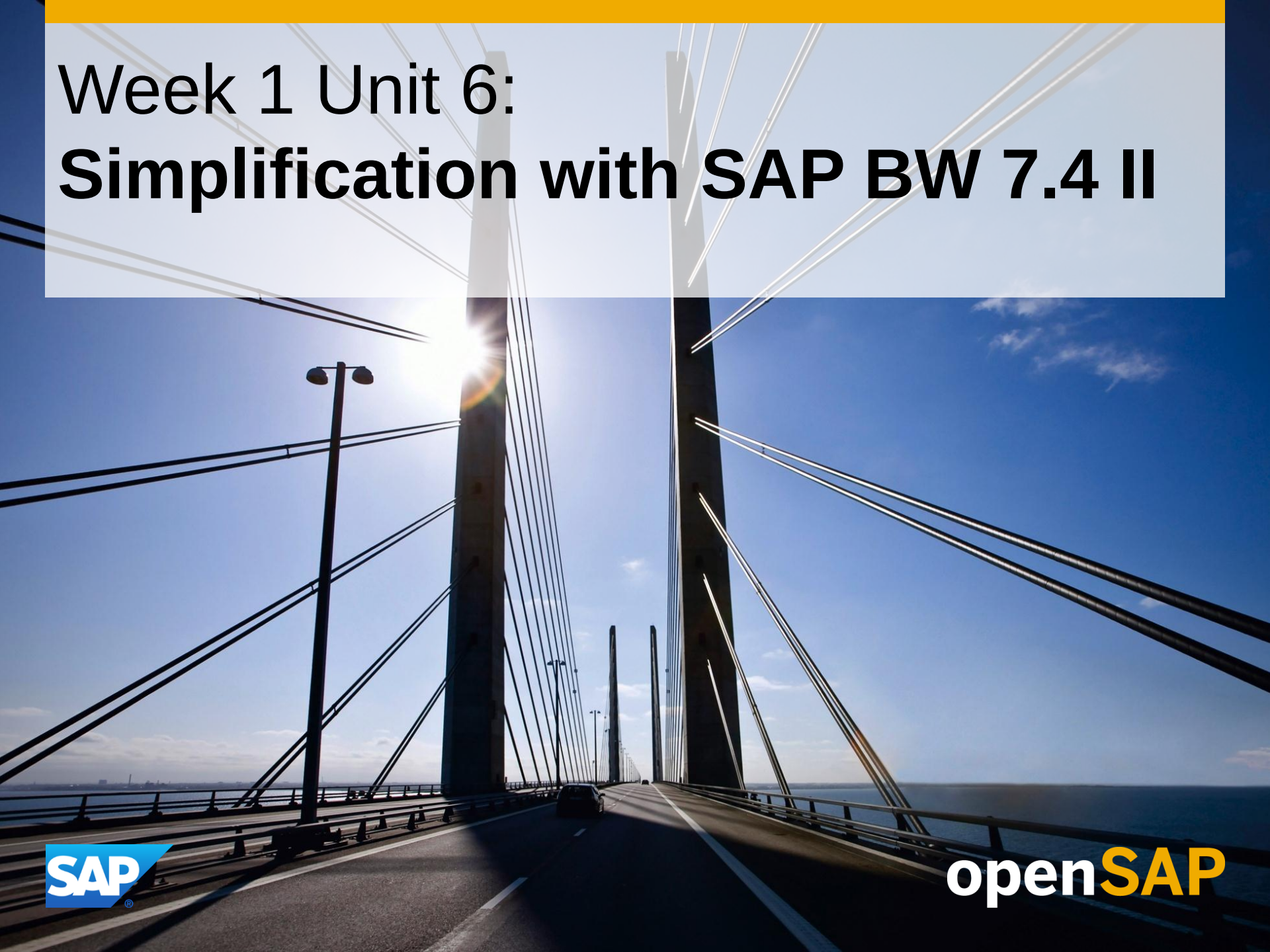
Week 1 Unit 6:
Simplification with SAP BW 7.4 II



SAP

openSAP

Simplification with SAP BW 7.4 II

Covered in This Unit

Content

- SAP HANA optimizations in data modeling
- Architectural simplifications
- New scenarios

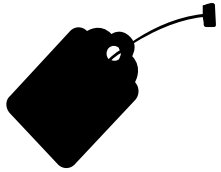
Simplification with SAP BW 7.4 II

SAP BW powered by SAP HANA – A Perfect Match

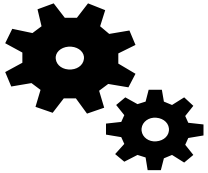
Only the combination of SAP BW and SAP HANA enables us to:

- Simplify the data modeling processes
- Increase the agility of the Enterprise Data Warehouse (EDW)
- Reduce the complexity of the EDW landscape
- Combine the strengths of an SQL-oriented approach with an integrated EDW application

One common modeling environment



Seamless consumption of data



Process large amounts of data faster

Reuse SAP BW services to manage and analyze the data

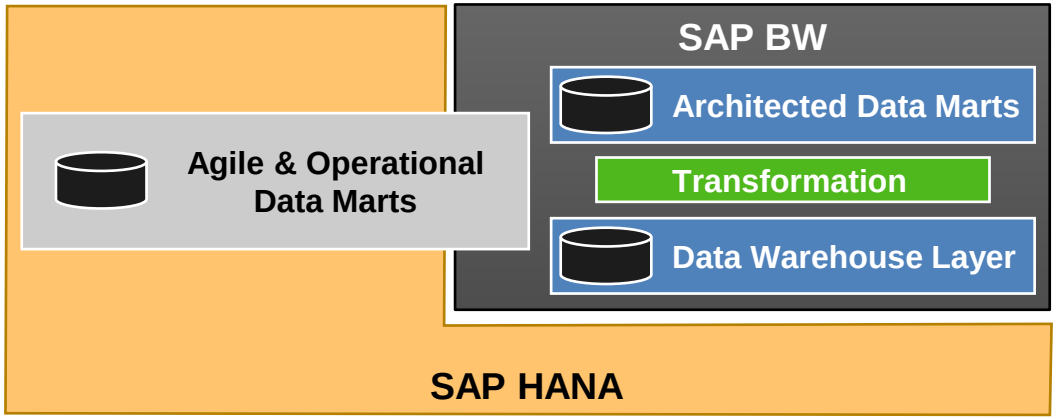
Simplification with SAP BW 7.4 II

SAP HANA Enables New Modeling Approaches in SAP BW

SAP BW powered by SAP HANA

- Objects of SAP BW, for example, master data, can be exposed into SAP HANA.
- SAP BW is able to consume and integrate SAP HANA models in SAP BW (CompositeProvider).
- Leverage SAP HANA interfaces, tools, and algorithms within SAP BW.

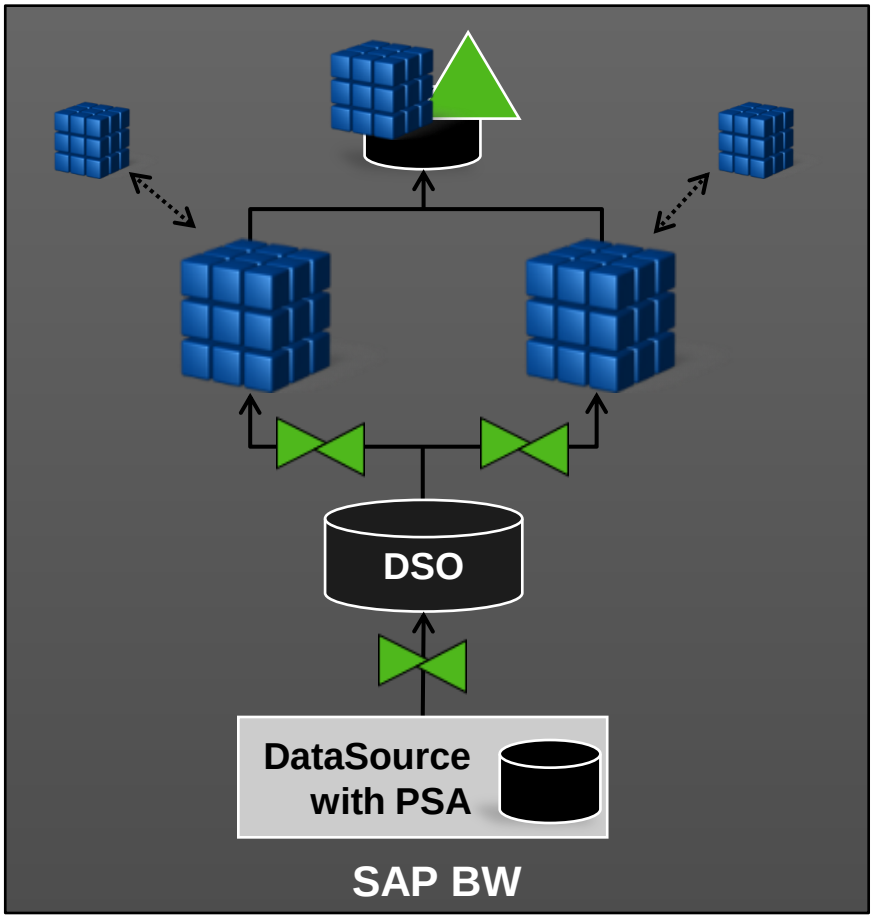
Consider SAP BW and SAP HANA as one consistent and optimized modeling platform.



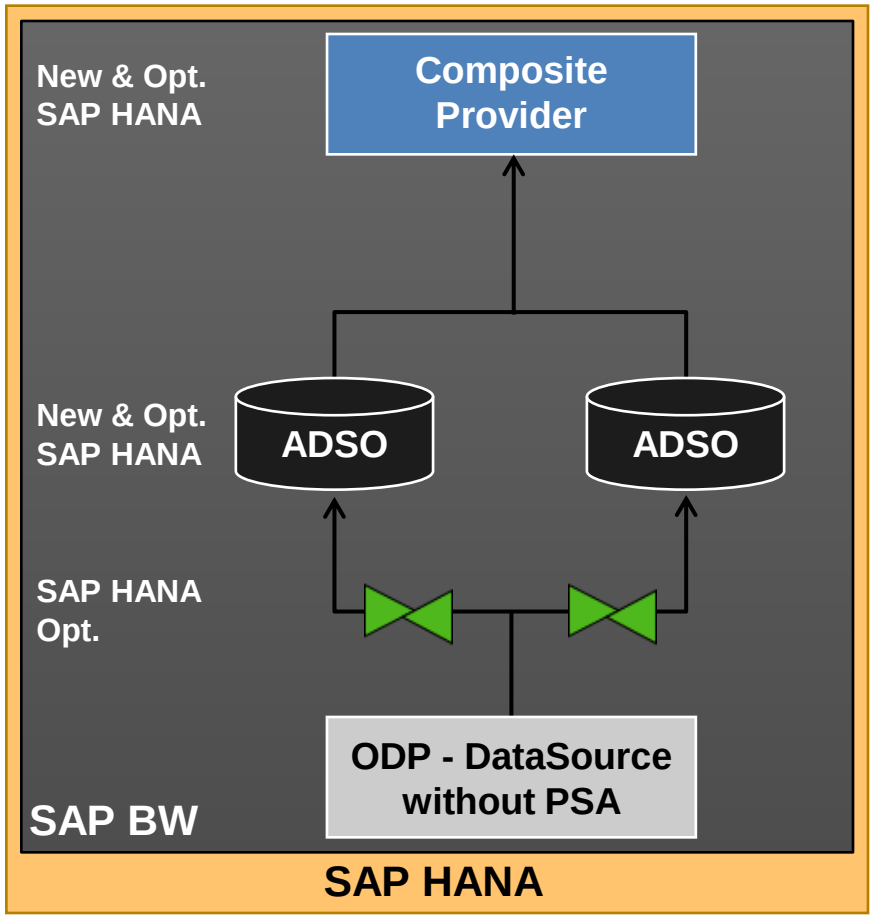
Simplification with SAP BW 7.4 II

Step 2 – Following New SAP HANA-Optimized Approaches

Traditional SAP BW with Any DB



SAP BW with SAP HANA

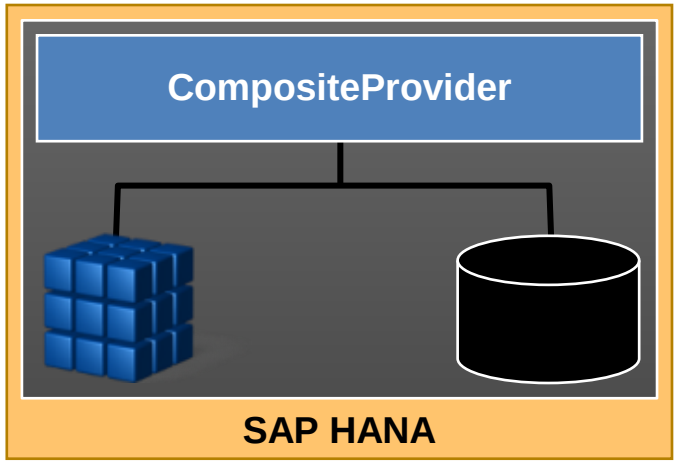


Simplification with SAP BW 7.4 II

New Key Objects in SAP BW 7.4

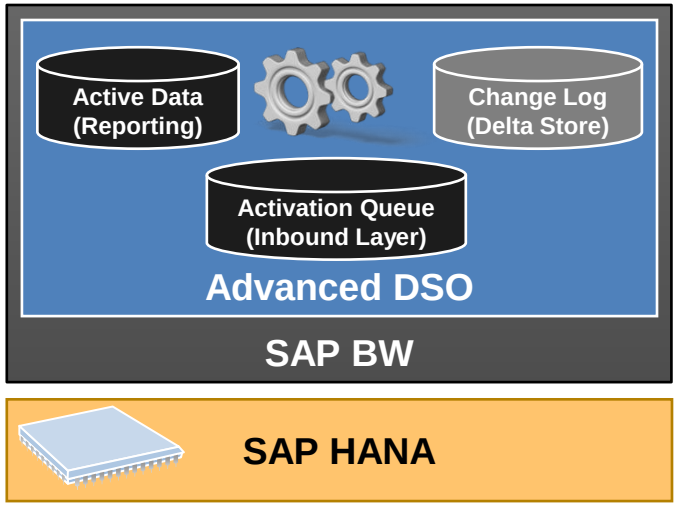
“New” CompositeProvider

- Supports union/join operations
- Combines the data of various applications, for example, SAP BW and SAP HANA data
- Join between SAP BW InfoProviders



Advanced DataStore object (DSO)

- Next generation for data persistence object in SAP BW
- Consolidates InfoProviders by providing their services

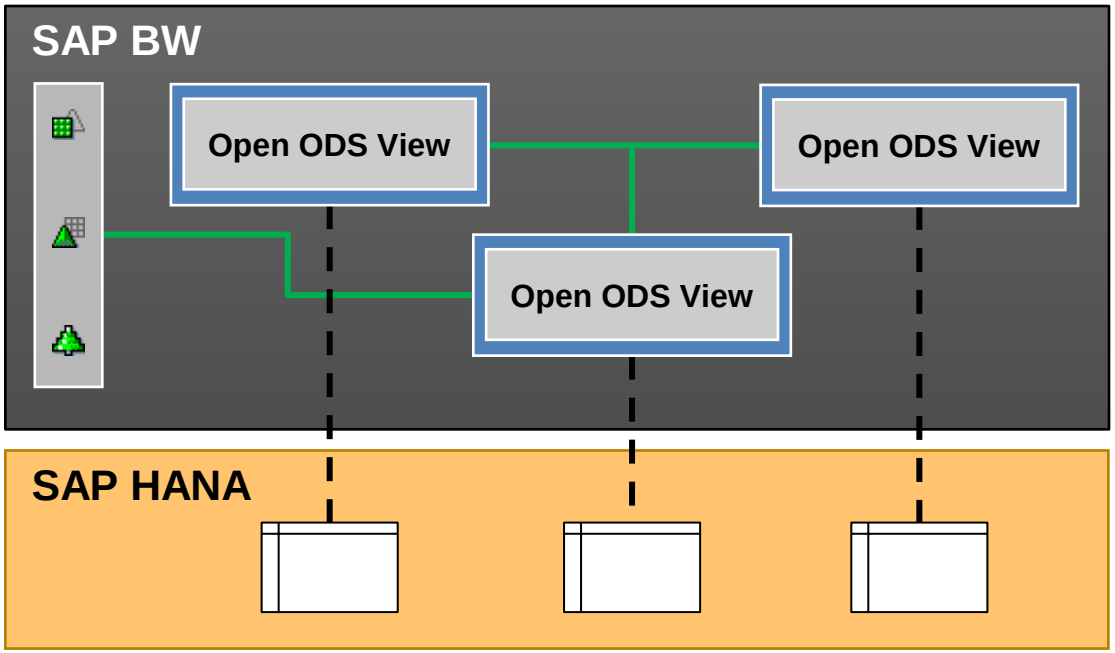


Simplification with SAP BW 7.4 II

New Key Objects in SAP BW 7.4

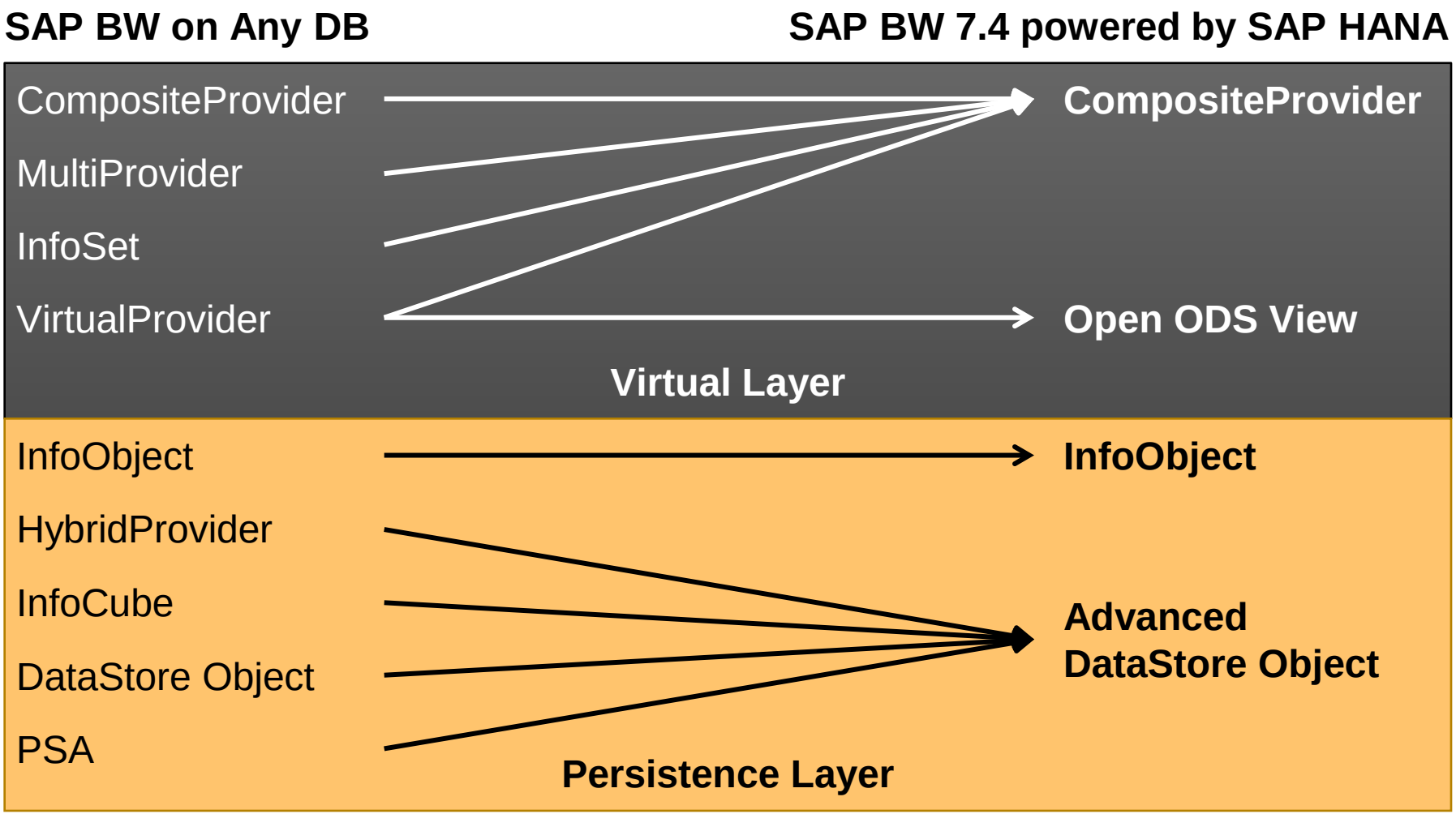
Open ODS View as new object to consume external sources with a given semantic

- Define analytic semantics without using InfoObjects
- Allows field-based modeling
- Use analytic functionality on top of (external) data structures due to different interfaces like SAP HANA smart data access
- Combine external data with SAP BW master data and transaction data



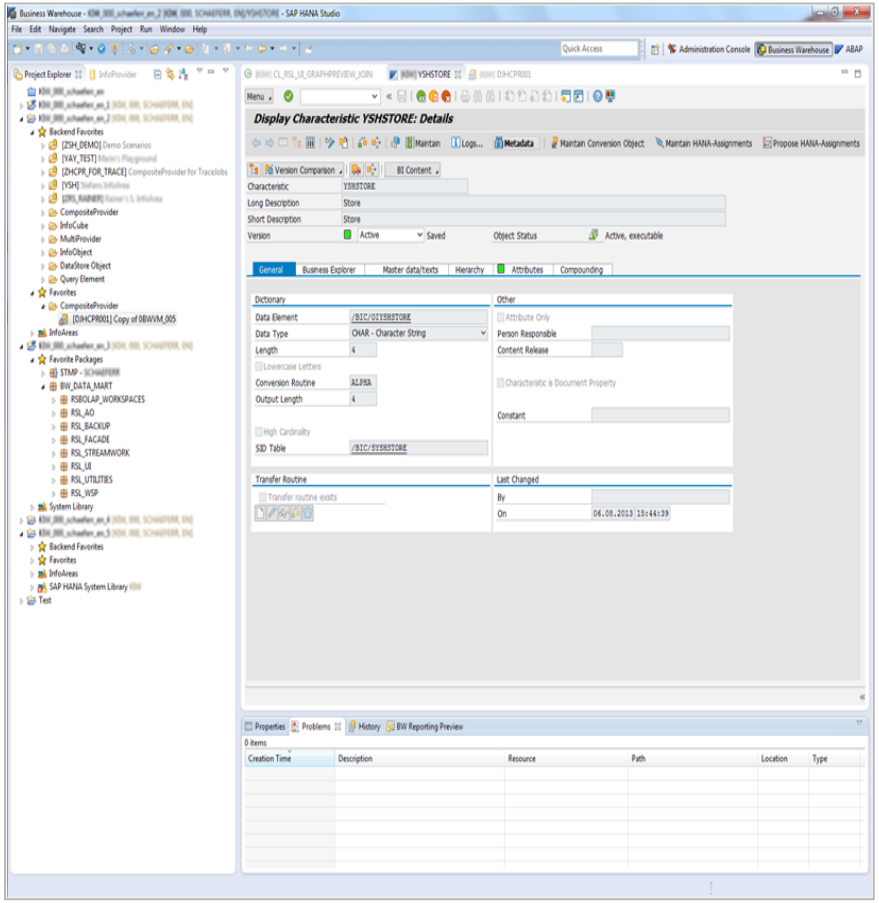
Simplification with SAP BW 7.4 II

New with SAP BW 7.4 SP8



Simplification with SAP BW 7.4 II

New Integrated Development and Modeling Environment



SAP HANA Studio	SAP BW Modeling Tools	ABAP Development Tools

Eclipse Platform

Common user experience via a central, unified modeling environment

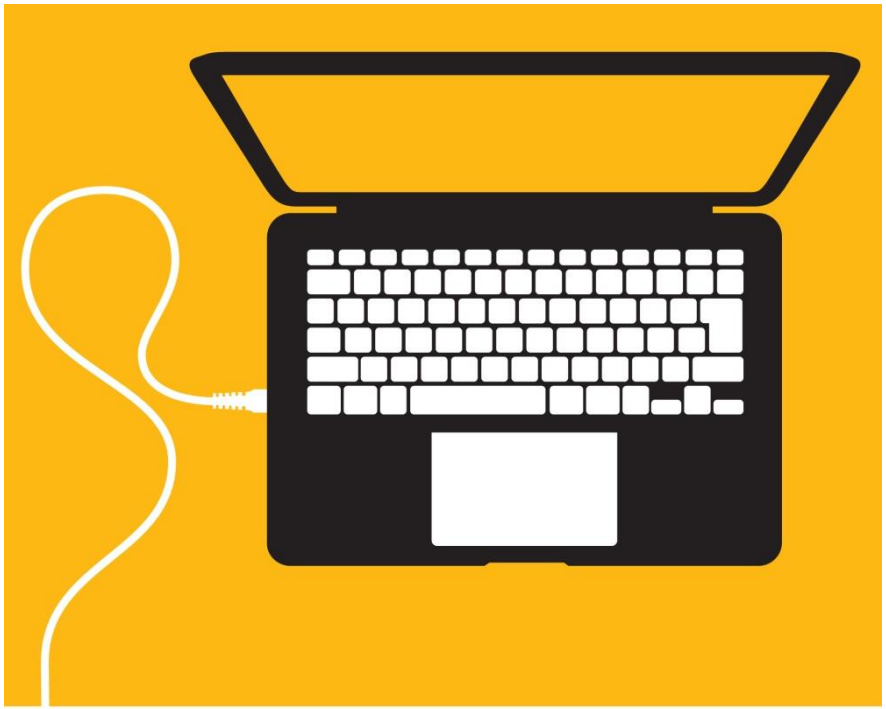
- Attractive, flexible and simplified BW modeling tools
- Harmonization SAP BW and SAP HANA modeling environments
- Integration of SAP BW and SAP HANA models in one modeling approach

Simplification with SAP BW 7.4 II

What You've Learned in This Unit

Eclipse-based modeling platform

- BW modeling tools (BWMT) as new modeling environment
- SAP GUI in Eclipse
- Eclipse-based modeling for new InfoProvider



Simplification with SAP BW 7.4 II

What You've Learned in This Unit

Key takeaways

- New architectures should consider SAP BW and SAP HANA as modeling environment for implementations.
- SAP BW 7.4 simplifies data modeling by consolidating InfoProviders.
- New InfoProvider adds more flexibility in architecture, for example, CompositeProvider with joins between InfoProviders.
- Eclipse-based modeling is available for new objects like CompositeProvider, Open ODS View, and (advanced) DataStore object.

Thank you

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