HDW410
SAP HANA Data Warehousing SQL Approach

COURSE OUTLINE

Course Version: 16
Course Duration:
SAP Copyrights, Trademarks and Disclaimers

© 2020 SAP SE or an SAP affiliate company. All rights reserved.

No part of this publication may be reproduced or transmitted in any form or for any purpose without the express permission of SAP SE or an SAP affiliate company.

SAP and other SAP products and services mentioned herein as well as their respective logos are trademarks or registered trademarks of SAP SE (or an SAP affiliate company) in Germany and other countries. Please see http://global12.sap.com/corporate-en/legal/copyright/index.epx for additional trademark information and notices.

Some software products marketed by SAP SE and its distributors contain proprietary software components of other software vendors.

National product specifications may vary.

This course may have been machine translated and may contain grammatical errors or inaccuracies. These materials are provided by SAP SE or an SAP affiliate company for informational purposes only, without representation or warranty of any kind, and SAP SE or its affiliated companies shall not be liable for errors or omissions with respect to the materials. The only warranties for SAP SE or SAP affiliate company products and services are those that are set forth in the express warranty statements accompanying such products and services, if any. Nothing herein should be construed as constituting an additional warranty.

In particular, SAP SE or its affiliated companies have no obligation to pursue any course of business outlined in this document or any related presentation, or to develop or release any functionality mentioned therein. This document, or any related presentation, and SAP SE’s or its affiliated companies’ strategy and possible future developments, products, and/or platform directions and functionality are all subject to change and may be changed by SAP SE or its affiliated companies at any time for any reason without notice. The information in this document is not a commitment, promise, or legal obligation to deliver any material, code, or functionality. All forward-looking statements are subject to various risks and uncertainties that could cause actual results to differ materially from expectations. Readers are cautioned not to place undue reliance on these forward-looking statements, which speak only as of their dates, and they should not be relied upon in making purchasing decisions.
# Typographic Conventions

American English is the standard used in this handbook. The following typographic conventions are also used.

<table>
<thead>
<tr>
<th>This information is displayed in the instructor’s presentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstration</td>
</tr>
<tr>
<td>Procedure</td>
</tr>
<tr>
<td>Warning or Caution</td>
</tr>
<tr>
<td>Hint</td>
</tr>
<tr>
<td>Related or Additional Information</td>
</tr>
<tr>
<td>Facilitated Discussion</td>
</tr>
<tr>
<td>User interface control</td>
</tr>
<tr>
<td>Window title</td>
</tr>
</tbody>
</table>

*Example text*
<table>
<thead>
<tr>
<th>Course Overview</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit 1:</strong> Overview and Introduction</td>
<td>1</td>
</tr>
<tr>
<td>Lesson: Why SAP SQL Data Warehousing</td>
<td>1</td>
</tr>
<tr>
<td>Lesson: SAP HANA Platform</td>
<td>1</td>
</tr>
<tr>
<td>Lesson: SAP HANA Development Environment</td>
<td>1</td>
</tr>
<tr>
<td>Lesson: SAP HANA Enterprise Architecture Designer</td>
<td>1</td>
</tr>
<tr>
<td>Lesson: SAP HANA Data Warehousing Foundation</td>
<td>2</td>
</tr>
<tr>
<td>Lesson: SAP Data Hub</td>
<td>2</td>
</tr>
<tr>
<td><strong>Unit 2:</strong> Reference Architecture, Concepts, and Methods</td>
<td>3</td>
</tr>
<tr>
<td>Lesson: Reference Data Warehouse Architecture</td>
<td>3</td>
</tr>
<tr>
<td>Lesson: Reference Development Method</td>
<td>3</td>
</tr>
<tr>
<td><strong>Unit 3:</strong> Data Modeling</td>
<td>5</td>
</tr>
<tr>
<td>Lesson: Modeling Approaches</td>
<td>5</td>
</tr>
<tr>
<td>Lesson: Modeling Methods</td>
<td>5</td>
</tr>
<tr>
<td>Lesson: Conceptual Data Model</td>
<td>5</td>
</tr>
<tr>
<td>Lesson: Physical Data Model</td>
<td>5</td>
</tr>
<tr>
<td>Lesson: Persistence Types</td>
<td>5</td>
</tr>
<tr>
<td><strong>Unit 4:</strong> Implementation</td>
<td>7</td>
</tr>
<tr>
<td>Lesson: Implementing the Data Warehouse Model</td>
<td>7</td>
</tr>
<tr>
<td>Lesson: Data Provisioning and Transformation</td>
<td>7</td>
</tr>
<tr>
<td>Lesson: Analytical Objects</td>
<td>7</td>
</tr>
<tr>
<td>Lesson: Analysis - SAP Analytics Cloud</td>
<td>7</td>
</tr>
<tr>
<td>Lesson: SAP HANA Data Warehouse Scheduler</td>
<td>8</td>
</tr>
<tr>
<td>Lesson: Deployment</td>
<td>8</td>
</tr>
<tr>
<td><strong>Unit 5:</strong> SAP Data Hub</td>
<td>9</td>
</tr>
<tr>
<td>Lesson: Evolution of Data Management</td>
<td>9</td>
</tr>
<tr>
<td>Lesson: SAP Data Hub Architecture</td>
<td>9</td>
</tr>
<tr>
<td>Lesson: SAP Data Hub Applications and Services</td>
<td>9</td>
</tr>
<tr>
<td><strong>Unit 6:</strong> Outlook</td>
<td>11</td>
</tr>
<tr>
<td>Lesson: SAP HANA Data Warehousing Foundation Overview</td>
<td>11</td>
</tr>
<tr>
<td>Lesson: SAP Native DataStore Object</td>
<td>11</td>
</tr>
<tr>
<td>Lesson: SAP HANA Data Warehousing Foundation Components</td>
<td>11</td>
</tr>
</tbody>
</table>
Course Overview

TARGET AUDIENCE
This course is intended for the following audiences:

- Data Manager
- Application Consultant
- Development Consultant
- Technology Consultant
- Business Analyst
- Developer
- Enterprise Architect
- Trainer
Lesson 1: Why SAP SQL Data Warehousing

Lesson Objectives
After completing this lesson, you will be able to:

- Understand why the data warehousing environment requires new approaches, tools, and methods
- Explain the different SAP data warehousing approaches

Lesson 2: SAP HANA Platform

Lesson Objectives
After completing this lesson, you will be able to:

- Explain the core functionalities of the SAP HANA platform
- Explain how you administer and work with databases on SAP HANA
- Understand the tooling of SAP HANA Datamanagement Suite

Lesson 3: SAP HANA Development Environment

Lesson Objectives
After completing this lesson, you will be able to:

- Understand the architecture of the SAP HANA XSA platform
- Use the SAP HANA Web IDE
- Understand what SAP HANA EIM is
- Explain how Git version control works on SAP HANA
- Understand what CI/CD workflows are

Lesson 4: SAP HANA Enterprise Architecture Designer

Lesson Objectives
After completing this lesson, you will be able to:

- Understand the purpose and benefits of the SAP Enterprise Architecture Designer
- Understand the basic functionality of the SAP Enterprise Architecture Designer
Lesson 5: SAP HANA Data Warehousing Foundation

Lesson Objectives
After completing this lesson, you will be able to:

- Understand the purpose of the SAP HANA Data Warehousing Foundation option for SAP SQL Data Warehousing
- Explain what the separate data management tools do

Lesson 6: SAP Data Hub

Lesson Objectives
After completing this lesson, you will be able to:

- Understand the purpose of SAP Data Hub
- Understand the orchestration toolset SAP Data Hub offers
- Understand what SAP Data Hub pipelines do
Lesson 1: Reference Data Warehouse Architecture

Lesson Objectives
After completing this lesson, you will be able to:

● Understand the requirements of a modern data warehouse
● Explain the components of the reference architecture

Lesson 2: Reference Development Method

Lesson Objectives
After completing this lesson, you will be able to:

● Explain the reference development method
● Understand the importance of XSA for the reference method
● Comprehend the stages within the method
Lesson 1: Modeling Approaches

Lesson Objectives
After completing this lesson, you will be able to:

- Understand why models are important and helpful tools
- Describe the different models used in the data modeling process
- Explain the top-down approach
- Explain the bottom-up approach

Lesson 2: Modeling Methods

Lesson Objectives
After completing this lesson, you will be able to:

- Know that 3NF is a method that is frequently used in the data warehousing context
- Know that Dimensional Modeling is a method that is frequently used in the data warehousing context
- Describe the basic principles of the Data Vault method
- Describe the benefits of the Data Vault method

Lesson 3: Conceptual Data Model

Lesson Objectives
After completing this lesson, you will be able to:

- Explain the purpose of the CDM
- Extend a CDM using SAP EAD

Lesson 4: Physical Data Model

Lesson Objectives
After completing this lesson, you will be able to:

- Explain the purpose of the PDM
- Extend a Data Vault-style PDM using SAP EAD
Lesson 5: Persistence Types

Lesson Objectives
After completing this lesson, you will be able to:

- Describe the three different persistence types
- Generate the three persistence types via SAP HANA XSA
Lesson 1: Implementing the Data Warehouse Model

Lesson Objectives
After completing this lesson, you will be able to:

- Implement the PDM from the reference data warehouse architecture in SAP Web IDE
- Comprehend the repository structure recommended in this lesson
- Activate CDS objects in SAP Web IDE

Lesson 2: Data Provisioning and Transformation

Lesson Objectives
After completing this lesson, you will be able to:

- Understand how to create and edit synonyms in SAP Web IDE for data provisioning
- Create flowgraphs for the Stage Area, the RAW DWH, and the BID DWH in SAP Web IDE for data transformation
- Understand how sequence objects work and what their purpose is

Lesson 3: Analytical Objects

Lesson Objectives
After completing this lesson, you will be able to:

- Implement analytical base objects in SAP HANA with calculation views
- Implement a Data Mart in SAP HANA with calculation views

Lesson 4: Analysis - SAP Analytics Cloud

Lesson Objectives
After completing this lesson, you will be able to:

- Create models in SAP Analytics Cloud
- Create stories in SAP Analytics Cloud
Lesson 5: SAP HANA Data Warehouse Scheduler

Lesson Objectives
After completing this lesson, you will be able to:

- Enable the Data Warehouse Scheduler
- Implement task chains in SAP HANA Web IDE
- Create task chain schedules using SAP HANA Web IDE
- Monitor task chain schedules using SAP HANA Web IDE

Lesson 6: Deployment

Lesson Objectives
After completing this lesson, you will be able to:

- Explain how to manually deploy using SAP HANA XSA
- Explain how to continuously integrate and deliver using SAP HANA XSA, Git, and a CI/CD tool
Lesson 1: Evolution of Data Management

Lesson Objectives
After completing this lesson, you will be able to:

- Understand the evolution of data management in enterprise landscapes
- Understand the challenges enterprises face today when working with large amounts of distributed data
- Understand how SAP Data Hub is capable of helping enterprises to overcome these challenges

Lesson 2: SAP Data Hub Architecture

Lesson Objectives
After completing this lesson, you will be able to:

- Comprehend the core concept of SAP Data Hub
- Understand the technical architecture of SAP Data Hub

Lesson 3: SAP Data Hub Applications and Services

Lesson Objectives
After completing this lesson, you will be able to:

- Understand the capabilities, benefits, and use cases of the SAP Data Hub Metadata Explorer
- Discover data with SAP Data Hub
- Create workflows in SAP Data Hub
- Create data pipelines in SAP Data Hub
- Understand different use cases for SAP Data Hub
Lesson 1: SAP HANA Data Warehousing Foundation Overview

Lesson Objectives
After completing this lesson, you will be able to:

• Understand the purpose and benefits of the SAP HANA data warehousing foundation
• Get a first impression of the SAP HANA data warehousing foundation toolset

Lesson 2: SAP Native DataStore Object

Lesson Objectives
After completing this lesson, you will be able to:

• Understand the basic functionality of the SAP Native DataStore Object
• Understand different use cases for the SAP Native DataStore Object

Lesson 3: SAP HANA Data Warehousing Foundation Components

Lesson Objectives
After completing this lesson, you will be able to:

• Understand the functionality of the SAP Data Lifecycle Manager
• Understand the functionality of the SAP Data Warehouse Monitor
• Understand the functionality of the SAP Data Warehouse Scheduler
• Understand the functionality of the SAP Data Distribution Optimizer