Introducing SAP BW/4HANA

Data Warehousing For The Modern World

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We Are At The Threshold Of An Era Of Unprecedented Change

- **Rising Customer Expectations**: 5 billion people worldwide will become middle class.
- **A Dramatically Changing Workforce**: 75% of global workforce will be Millennials.
- **Pressure on Resources**: 50% of the world’s population will live under water shortage.
- **Network Effect/Explosion in Structured and Unstructured data**: 1.3 billion people on business & social networks today, 50 billion connected devices and *internet of things* by 2030.
The Modern Landscape

The era of unprecedented change
Key Computing Trends

**Cloud**
Cloud spending will surge by 25%, reaching over $100 billion. There will be a doubling of cloud data centers.

**Internet of Things**
30 billion devices, sensors in 2020 – driving $8.9 Trillion in revenue. The need for real-time processing and analytics will explode.

**Data Lake**
Data volumes will continue to grow to 6 billion petabytes, including unstructured data such as social networking data and low level IoT data. Mining the value from this data is essential.
40% executives **worry that their organizations will not keep pace** with technology change and lose their competitive edge.

— McKinsey study, 2013
Complexity Is Painful
What is an Enterprise Data Warehouse?
Functions of the Enterprise Data Warehouse (EDW)

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

Main Tasks
- Define common semantics
- Harmonize data values
- Establish a ‘single version of truth’
- Provide a single, comprehensive source of current and historical information
Typical Pain Points With Data Warehouses

Data
- No details / drill down to level of detail needed (single transaction) possible
- No integration of external data e.g. weather or data from social media sources possible
- Data that's available for analysis is already outdated
- No single definition of master data, measures, dimensions - Unclear quality of data used in analytics

IT
- High cost for changes to existing reports and analytics
- Huge backlog of requirements for reporting and analysis in IT
- Performance issues people annoyed at how long they have to wait for reports and answers
- Huge Upgrade costs as data volumes increase
- Vendor Consolidation / Risks

Capability
- Lack of advanced analytics / predictive methods – Data Science
- Contribution and Profitability analysis not possible on all levels of detail e.g. product, store, channel
- Cross channel analysis of performance or contribution not possible
- No Modern UI / Visualization
- How to Combine Business + Hadoop Data
Why SAP’s Modern Data Warehouse
Removing constraints to meet digital needs

1. Simplify
   - Remove previous technical and cost barriers through landscape simplification
   - Avoid data redundancy
   - Ease development of new application
   - Reduce manageability burden

2. Innovate
   - Digital Transformation is about Data-Driven Decision Making
     - Deliver advanced services that were not possible before
     - Run transactional and analytical workloads on the same data platform
     - Drive Data Science

3. Accelerate
   - Speed of execution is the make or break capability in this digital age
     - Take advantage of Cloud deployments and mobility solutions
     - Access data across the enterprise transparently
     - Use integrated Data management, IOT and UI Tools
     - Drive Value from Data Lake
SAP Data Warehousing Portfolio

- **SAP Business Warehouse**
  Enterprise business reporting

- **HANA Dynamic Tiering**
  Multi-temperature Tiering

- **HANA Smart Data Streaming**
  Real-time complex event processing

**SAP HANA PLATFORM**

- Real-time, in-memory database, data processing, and application platform

- **SAP IQ & NLS**
  Logical Big Data warehousing (OLAP)

- **HANA Advanced Analytics**
  Breakthrough performance at lower cost

- **SAP Data Services**
  All types of data integration

**A-Z**

- **Simplify**
- **Accelerate**
- **Innovate**

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SAP BW/4HANA - The Next Generation BW

- SAP BW 7.3 powered by SAP HANA
  - Performance optimization

- SAP BW 7.4 powered by SAP HANA
  - Simplification and Virtualization

- SAP BW 7.5 powered by SAP HANA
  - Simplification, HANA platform integration
  - Big Data scenarios

- SAP BW 7.5, edition for SAP HANA Add on
  - SAP BW/4HANA customers only
  - Use transfer tools to make system SAP BW/4HANA ready
  - Requires SAP BW 7.5 SP 4 or higher

- Introducing SAP BW/4HANA
  - The Next Generation BW

Timeline:
- 2012
- 2013
- 2015
- 2016 +
SAP Business Warehouse - Today

- **16000+** SAP BW Customers
- **7800+** SAP BW 7.3 / 7.4 Customers
- **3600+** SAP BW on SAP HANA Customers

- Vast majority use SAP BW as central EDW, harmonizing many source systems
- Embedded into mission critical business processes
- Continuously growing SAP HANA adoption
- Strategy to run simple with SAP BW

Status: September 2016
SAP BW/4HANA ENABLES THE NEXT GENERATION DATA WAREHOUSE REQUIREMENTS

SAP HANA PLATFORM
[Streaming Analytics | Advanced Analytics | Smart Data Integration]

SAP S/4HANA
Operational Reporting

SAP BW/4HANA
Historical Analysis

Logical Data Warehouse
Internet of Things
Data Lakes
SAP – Data Warehousing approaches

Two approaches

Application driven approach, SAP BW as EDW application with integrated services

• SAP BW as an application serves as a platform offering all required data warehousing services via one integrated repository

  ü No additional tools for modelling, monitoring and managing the data warehouse required, but can be integrated

SQL driven approach, SAP HANA with loosely coupled tools and platform services, logically combined

  ü Database approaches require several loosely couple tools to fulfill the necessary tasks with separate repositories

  ü A combination of tools (such as best of breed) used to build the data warehouse
SAP – Data Warehousing approaches
BW on HANA

- BW on HANA paved the way for merging both Relational and OLAP models
- BW on HANA provided both structured and freeform development environments
- Business was able to see both live and non live data together
- However the development for both Native and BW remained different
- Management of security, lifecycle, data temperature remained different
SAP – Data Warehousing approaches
BW/4 HANA

- **BW/4 HANA** truly a beginning of merger of both Native and Data Warehouse application
- BW/4 HANA embedded Native HANA development environments
  - Single Development environment for both BW and HANA
  - Incorporation of ETL Tools
  - Scheduling of Data loads and Extracts
- BW/4 HANA incorporates Data management
  - Big Data Integration
  - Data Optimization and distribution among Scale out

BW/4 HANA is a Data warehouse and Data management application which lends itself for building a holistic Enterprise Data Warehouse. It is no longer a question of BW or Not.
SAP BW/4HANA…

- A new data warehousing solution
- Highly optimized for SAP HANA like SAP S/4HANA
- Leverages SAP HANA differentiators (e.g. integration, …)
- Integrates with new data sources and engines
- Creates the Logical Data Warehousing foundation

New in SAP BW/4HANA …

- Accelerate open data warehousing development
- Advanced multi-temperature management option
- Modern Interface
- Built for cloud
Simplicity

Simplified Data Structures
Simplified Data Flows
Data Lifecycle Management
SAP BW/4HANA – Simplified Data Structures

- Number of modelling object types reduced from 10 to 4
- No complex data structures (extended star schema)
- Field or InfoObject based modelling
- Greater control of data persistency and virtualization
- Support for external, structured and unstructured data
SAP BW/4HANA – Simplified Data Flows
From Layered Scalable Architecture (LSA) to LSA++

Classic SAP BW (LSA)
- Source
- Staging
- Raw DWH
- Integrated DWH
- Data Marts
- Virtualization

Top down modelling

SAP BW/4HANA (LSA++)
- Source
- Staging
- Raw DWH
- Integrated DWH
- Data Marts
- Virtual Data Marts

Mandatory layers

Virtualization

Virtual Data Marts

Data Marts

Integrated DWH

Raw DWH

Staging

Service Level

Mandatory layer

Optional layers depending on required business and service level

Top down modelling

Bottom up modelling

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SAP BW/4HANA – Simplified Data Flows

- Report at any layer of the Data Warehouse with speed and flexibility

![SAP BW/4HANA (LSA++) diagram]

- Virtual Data Marts
- Data Marts
- Integrated DWH
- Raw DWH
- Staging
- Source

Service Level

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• Report at any layer of the Data Warehouse with speed and flexibility

• Virtually combine data across layers
SAP BW/4HANA – Simplified Data Flows

- Report at any layer of the Data Warehouse with speed and flexibility
- Virtually combine data across layers
- Business and service level driven

SAP BW/4HANA (LSA++)

- Virtual Data Marts
  - Data Marts
    - Integrated DWH
    - Raw DWH
  - Staging
  - Source

bottom up modelling
top down modelling

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SAP BW/4HANA – Simplified Data Flows

- Report at any layer of the Data Warehouse with speed and flexibility
- Virtually combine data across layers
- Business and service level driven
- Combining bottom-up and top-down modelling approaches – allows for agile and flexible development
NEW: ADVANCED MULTI-TEMPERATURE MANAGEMENT OPTION

- SAP HANA
  - Hot Data
    - Modern in-memory platform
    - Real-time transaction and analysis
    - Native predictive, text, and spatial algorithms

- SAP HANA Dynamic Tiering
  - Warm Data
    - New: in-memory dynamic tiering option
    - Disk-based, dynamic tiering option using smart columns
    - High performance and efficient compression
    - Excels at queries on structured data, from terabyte to petabyte scale
    - No data duplication

- SAP IQ NLS and ADK
  - Cold or Frozen Data
    - Data persistence optimized in system landscape through relocation of infrequently accessed data to SAP IQ
    - Less frequently accessed data archived in time partitions
    - NLS data resides in a highly compressed state in cost-efficient storage with fewer backups to reduce operational costs

- SAP HANA Vora HADOOP
  - Candidate Data
    - Acceleration with SAP HANA Vora
    - SAP HANA smart data access capability for Hive- and Spark-type scenarios

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Openness

Native SQL access
Simple Data Integration
SAP BW/4HANA – Native SQL Access

SAP BW/4HANA logic and data can be exposed to SAP HANA

Automatic generation of SAP HANA views allows:

- SQL logic on top of generated views
- Combined data from native SAP HANA
- SQL access for front-end tools

Generated SAP HANA views are part of SAP BW/4HANA lifecycle and SAP BW/4HANA security
Leverages SAP HANA EIM to provide new data provisioning opportunities:

- Replicate data in real-time (EIM-replication or SLT)
- Access data virtually
- Load data using optimized processing

Or automatically switch between the different methods.
Number of Source System Types reduced from 7 to 3

- HANA Source System for all database and file connectivity
- ODP Source System for SAP backend systems and SLT

Traditional source systems still exist but future innovations are focusing the consolidated objects on SAP HANA
Modern Interface

New Business User UX
New Modeler UX
New Administrator UX
SAP BW/4HANA – New Modeling User Interface
SAP BW/ 4HANA – New Business User Interface

BW Business Explorer (BEx)

SAP BusinessObjects Analysis Office

SAP BusinessObjects Design Studio

SAP BusinessObjects Cloud
BEx Tools & Their Corresponding Tools In BW/ 4HANA

1. BEx Query
   - Same technical object
   - Only name & editor has changed
   → BW Query

2. BEx Analyzer
   - Import function for workbooks available
   → Analysis for Office

3. BEx WAD
   - Recreate reports in Design Studio/Lumira 2.0
   → Design Studio/Lumira 2.0

4. BEx Report Designer
   - Recreate reports in Crystal Reports
   → Crystal Reports

5. BEx Broadcaster
   - Recreate broadcasting on BO Server
   → BO Server
SAP BW/4HANA – New Interface for Administrators

ABAP Process Chain Monitor

UI5-based Process Chain Monitor
High Performance
In-Memory Data Warehousing
Algorithm Pushdown
Advanced Analytics
SAP BW/4HANA – In-memory Data Warehousing

Query all data at the speed of SAP HANA

- No Aggregates or Roll-up Processes
- No Performance Specific Objects
- Fewer Indexes
- Faster Loading and Processing
SAP BW/4HANA - Algorithm Push-down

Significant performance gain through push-down of operations/calculations:

- OLAP Engine, complex query calculations (e.g. exception aggregation)
- Planning functions (e.g. disaggregation)
- Data management (e.g. transformation logic)
Enhance data with Advanced Analytics using HANA specific libraries (AFL), R-Script or a custom HANA procedure

- Predictive
- Text Analysis
- Data Mining
- Machine Learning
Comparison Of BW Editions Leading to BW4HANA

- Next generation product on a new code line
- Simplified data model
- Code push down into HANA
- Advanced multi-temperature data management
- Next generation UI for developers and users
### SAP BW/4HANA

**Planned Tool Support for Simple Transition**

<table>
<thead>
<tr>
<th>Planned for Q3 2016</th>
<th>Planned for Q4 2016</th>
<th>Planned for Q2 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>ü Copy complete data flows</td>
<td>ü Including data transition</td>
<td>ü Covering complex scenarios e.g. NLS</td>
</tr>
<tr>
<td>ü Automatic generation of HANA-optimized objects</td>
<td>ü Support of Process Chains, DataSources</td>
<td>ü HANA-optimized for faster data transition</td>
</tr>
<tr>
<td>ü Conversion of DB Connect Source Systems to HANA Source Systems</td>
<td>ü Enhanced user experience based on task lists</td>
<td>ü “1-Step” conversion based on tool support and SAP Services</td>
</tr>
<tr>
<td>ü Secure Metadata transition</td>
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Paths to SAP BW/ 4HANA

New Installation
System Conversion
Landscape Transformation
# Transition to SAP BW/4HANA

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Customer</td>
<td>New customer to SAP or ready for a fresh start, migrate data from your legacy system to a new installation of SAP BW/4HANA with our integrated data management and quality tools.</td>
</tr>
<tr>
<td>SAP BW on AnyDB</td>
<td>Upgrade your BW-on-AnyDB to BW-on-HANA then migrate to SAP BW/4HANA object set and convert to SAP BW/4HANA.</td>
</tr>
<tr>
<td>SAP BW on SAP HANA</td>
<td>Migrate to SAP BW/4HANA object set then convert to SAP BW/4HANA.</td>
</tr>
<tr>
<td>Landscape Simplification</td>
<td>Simplify your system landscape to carve out selected processes/functions, moving gradually to SAP BW/4HANA innovations. Improve M&amp;A activities by consolidating rapidly, delivering predictive capabilities.</td>
</tr>
</tbody>
</table>
Thank you