Southern California Edison Unleashes the Power of SAP HANA

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Agenda

SAP HANA Appliance Software
- What Is It?
- SAP HANA Strategy

The Southern California Edison SAP HANA Story
- Business Drivers
- Business Intelligence Journey
- SAP HANA Program
  - Pilot Plan
  - Pilot Results
  - Production Implementation
- Technical Highlights
- Total Cost of Ownership
- SAP HANA – *The Game Changer*

Decision maker obtaining business intelligence

SAP HANA

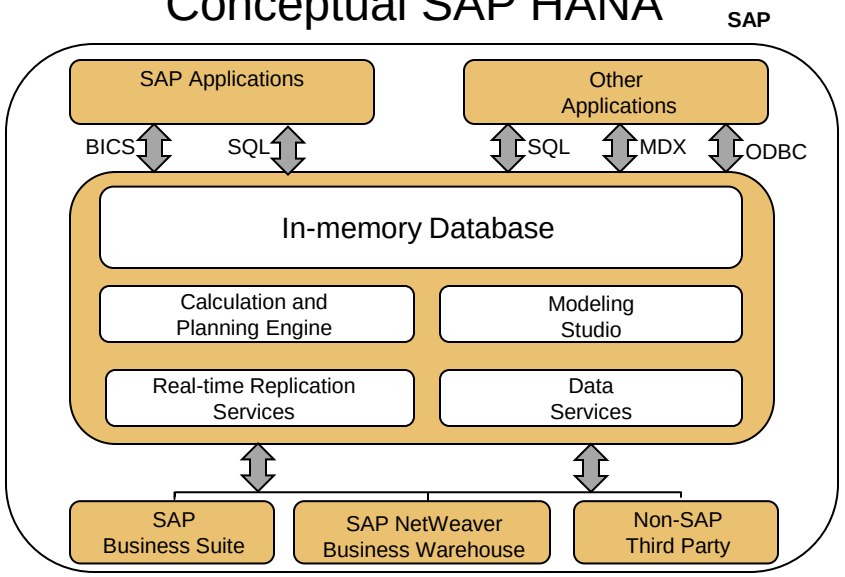
Data in enterprise business applications

SAP HANA – *What Is It?*

Conceptual SAP HANA

- Data modeling and data management
- Real-time data replication
- SAP Data Services software for ETL
- Analyze information at high speeds
- Create flexible analytical models
- Foundation for new category of applications

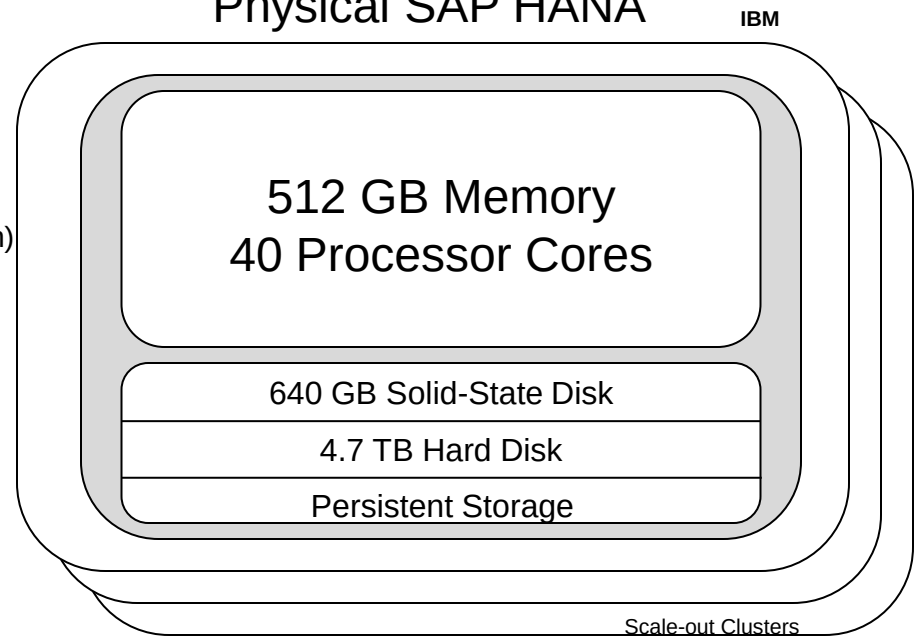
Conceptual SAP HANA



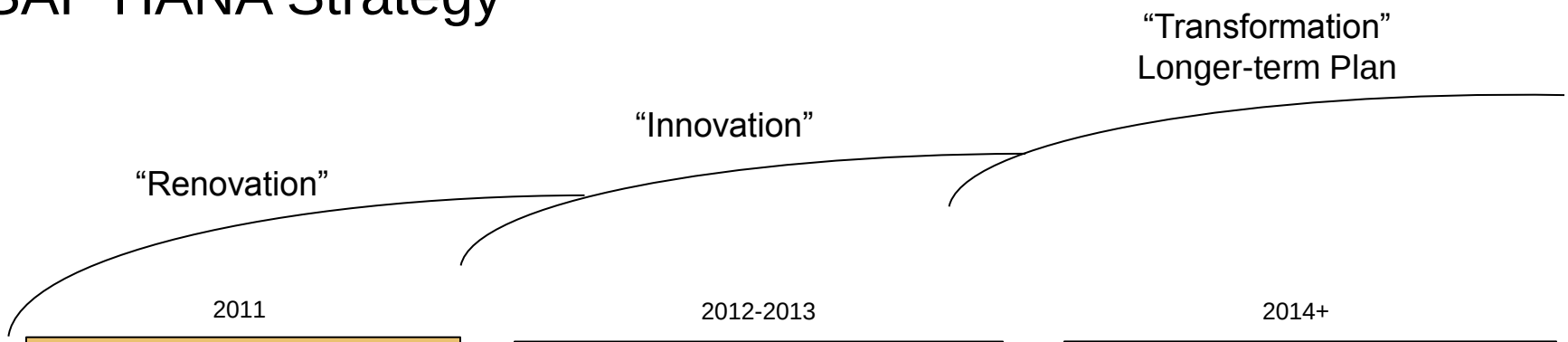
Physical SAP HANA

- Large memory footprint (1m faster than disk)
- Multi-core CPUs (computational power)
- Row and column store (column = fast aggregation)
- Compression (5x+, 1 TB = 200 GB)
- Non-materialized views (flexible modeling, no data duplication)
- Multi-core direct memory data loading (fast data loads)
- Partitioning (analyze large data sets; complex computations)

Physical SAP HANA



SAP HANA Strategy



2011	2012-2013	2014+
In-memory Analytics	**Next-gen Applications**	**One Store for Data and Analytics**
Stand-alone SAP HANA	SAP NetWeaver BW on SAP HANA, SAP ECC on SAP HANA, SAP CRM on SAP HANA….	Integrated SAP HANA
• SAP HANA real-time operational analytics • Complete BI 4.0 suite runs on SAP HANA	• SAP NetWeaver Business Warehouse (SAP NetWeaver BW) runs on SAP HANA database • SAP HANA platform for in-memory applications • SAP Business Suite runs on SAP HANA • Industry and LOB analytic applications	• SAP HANA primary persistence layer for SAP Business Suite applications • SAP Business Suite optimized for in-memory computing

Technology Platform	Content	Accelerators	Products on In-memory	Next-Generation Applications
Customer-Specific Development	Reports re-built on SAP HANA using a BI front end	Speed up existing SAP Business Suite functionality/applications through a side-by-side scenario with SAP HANA	Existing applications and strategic investment areas that may be disruptive	New applications not delivered before and native in-memory applications.
e.g., CRM; FERC	e.g., Operational reporting	e.g., CO-PA; material ledger; general ledger	e.g., SAP NetWeaver BW 7.3 on SAP HANA	e.g. ,Smart meter analytics; outage management; and energy procurement

Southern California Edison Business Drivers

Next-Generation Analytics

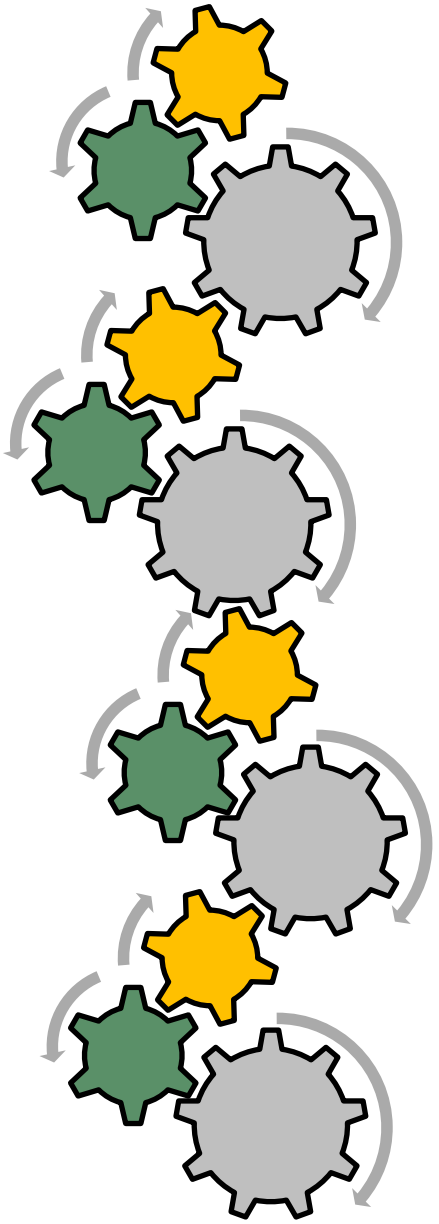
Stand-alone SAP HANA

- Faster analytics
- Modeling flexibility
- Near real-time data replication
- Calculation engine and built-in functions
- Big Data footprint
- New applications – potential examples:
  - Smart meter analytics
  - Power outage management
  - Power procurement
  - Predictive analytics

Operational Improvement

SAP NetWeaver BW running on SAP HANA database

- Faster reporting
- Faster data loading
- Lower TCO
- Reduced maintenance costs
- Reduced development costs



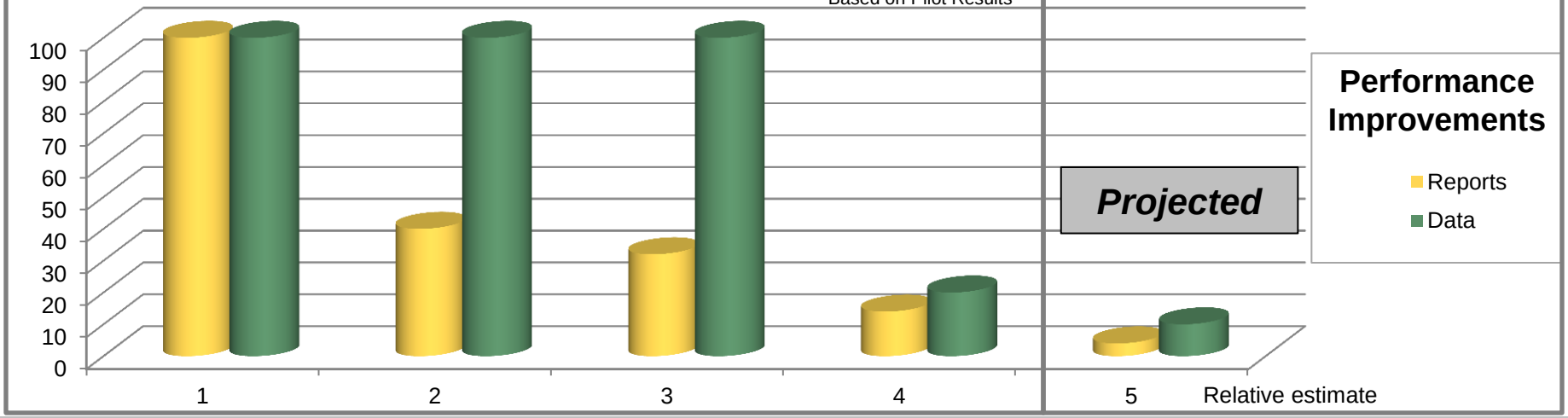
The Southern California Edison Business Intelligence Journey

Operational Improvement (*SAP NetWeaver BW Running on SAP HANA*)

Analytics (*New Capabilities*)

SAP NetWeaver BW 2007 (1)	**SAP NetWeaver BW - BWA** 2009 (2)	**SAP NetWeaver BW - BWA** 2011 (3)	**SAP NetWeaver BW Running on SAP HANA** 2012 (4)	**Stand-alone SAP HANA** 2012 (5)	**Integrated SAP HANA** 2014+
Legacy DB Without BWA or SAP software	Legacy DB - BWA With SAP BusinessObjects BI SP2	Legacy DB - BWA With SAP BusinessObjects BI SP4	SAP HANA With SAP BusinessObjects BI 4.0 FP3	Calc Engines	SAP ECC, SACRM, SAP NetWeaver BW, and Stand-alone Integration
<u>Baseline</u> • No SAP NetWeaver BW Accelerator • No SAP BusinessObjects BI	<u>Faster Report Speed</u> • SAP NetWeaver BW Accelerator 2.5x faster reporting • Early version of SAP BusinessObjects BI not stable	<u>Faster Report Speed</u> • SAP BusinessObjects BI SP4 very stable • Reports are faster: Avg (20%) CRM(7x)	<u>Legacy DB repl with SAP HANA</u> • Reports are faster 5.0 times • Delta Data Loads are much faster (3.2x)	<u>SAP HANA Stand-alone Database</u> • Optimized calculation engines with parallel processing • *Radical Improvement*	<u>SAP HANA Stand-alone Database</u> • SAP HANA environments virtually or physically merge
• Reports: • Avg 90 sec • CRM 400 sec • Data Loads 15 hrs	• Reports: • Avg 40 sec • CRM 161 sec • Data Loads 15 hrs	• Reports: • Avg 32 sec • CRM 23 sec • Data Loads 15 hrs	• Reports: • Avg 6.4 sec • CRM 4.6 sec • Data Loads 4.6 hrs	• Analytics: • Telecom CRM 55:1 • Smart Meter Analytics 40:1	• More agile • Seamless • Less costly development

Based on Pilot Results



SAP HANA at SCE – Pilot

	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W14	W15	W16	W17
Task Name	1/9/2012	1/16/2012	1/23/2012	1/30/2012	2/6/2012	2/13/2012	2/20/2012	2/27/2012	3/5/2012	3/12/2012	3/19/2012	3/26/2012	4/2/2012	4/9/2012	4/16/2012	4/23/2012	4/30/2012
SAP HANA Pilot Program																	
Project Management																	
Pilot Planning																	
Production Planning																	
System Setup																	
Hardware																	
Software																	
Data Migration																	
SAP NetWeaver BW Running on SAP HANA																	
SAP HANA Stand-alone																	
SAP NetWeaver BW Running on SAP HANA Enhancement																	
SAP NetWeaver BW Running on SAP HANA Optimization																	
Data Modeling																	
Design																	
Build																	
Migrate and Validate																	
Security Setup																	
SAP NetWeaver BW Running on SAP HANA																	
SAP HANA Stand-alone																	
Report Development & Test																	
SAP NetWeaver BW Running on SAP HANA																	
SAP HANA Stand-alone																	
Explorer Testing																	
SAS Validation																	
SLT Validation																	
Backup Restore																	

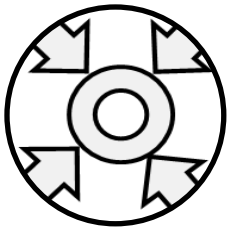
Validate:

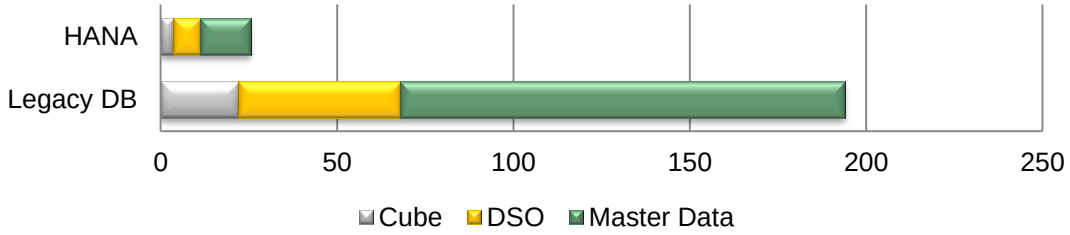
- Compression
- Data loading speed
- Report response time
- Back-up and restore
- Security

Pilot Results

Comparing **SAP NetWeaver BW Running on SAP HANA** vs.
SAP NetWeaver BW Running on Legacy Database with SAP NetWeaver BW Accelerator

Data Compression (column store)

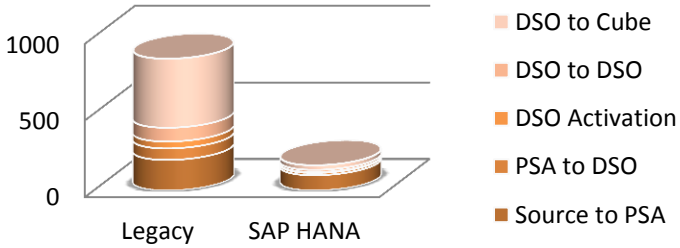




7.5 x

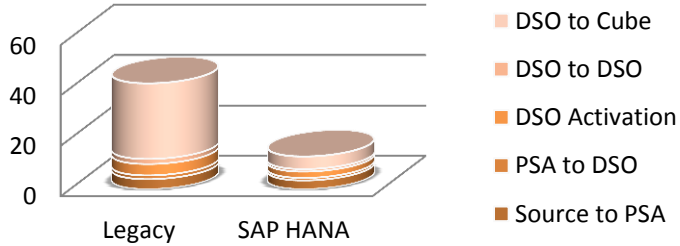
Projected for Production = 5.7 x

Data Loading - Full



5.2 x

Data Loading - Delta

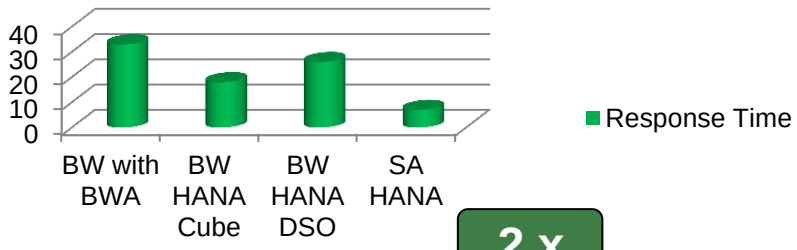


3.2 x

Response Time (Simple)

5 x

Response Time (Complex)



2 x

SAP HANA at SCE – Production

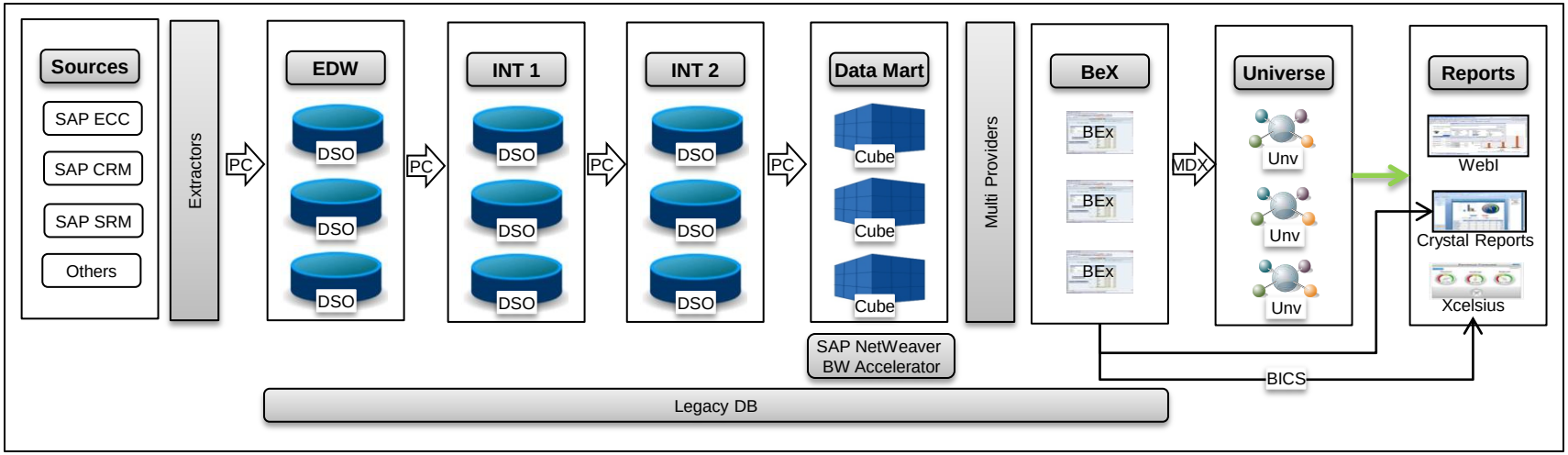
	W1	W3	W5	W7	W9	W11	W13	W15	W17	W19	W21	W23	W25	W27	W29	W31	W33
Phase	5/1/2012	5/15/2012	5/29/2012	6/12/2012	6/26/2012	7/10/2012	7/24/2012	8/7/2012	8/21/2012	9/4/2012	9/18/2012	10/2/2012	10/16/2012	10/30/2012	11/13/2012	11/27/2012	12/11/2012
Planning																	
Project Management																	
Pre-Trial																	
Development/ Unit Test																	
Reg Testing Cycle 1																	
Reg Testing Cycle 2																	
User Acceptance																	
Performance Testing																	
Production Cutover																	
Post Production																	
Stabilization																	

Goals:

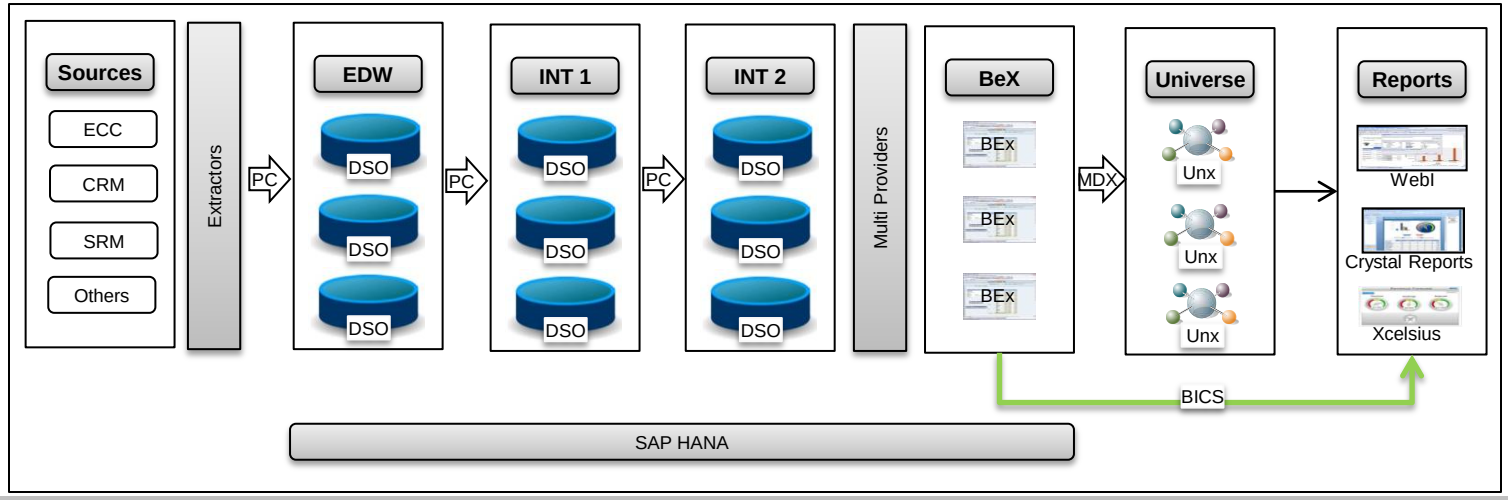
- Migrate all of SAP NetWeaver BW legacy DB into SAP NetWeaver BW running on SAP HANA
- Incorporate BCS and IP into SAP NetWeaver BW running on SAP HANA
- Reduce nightly batch loading
- Improve reporting performance
- Migrate the enterprise SAP BusinessObjects BI from 3.1 to 4.0 (FP 3)
- Create the ability to handle “Big Data” analytics
- Leverage built-in calculation engines
- Create one or more new applications in stand-alone SAP HANA

Business Intelligence Development Process

Current Environment – SAP NetWeaver BW Legacy DB, SAP BusinessObjects BI 3.1 SP4, SAP Data Services 3.2

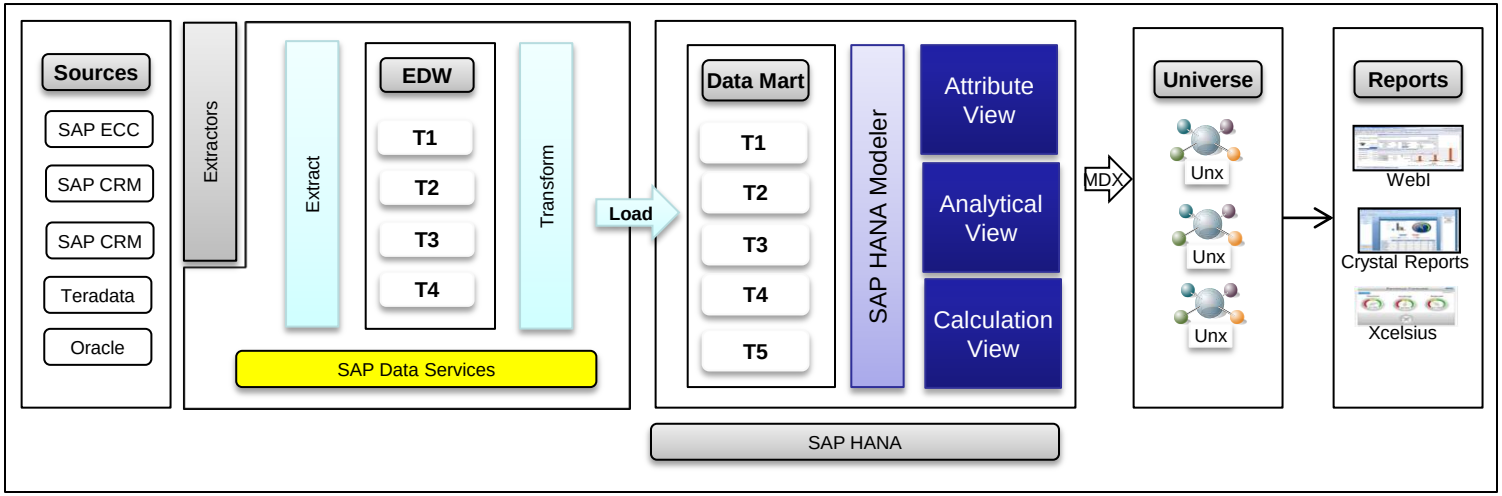


New 2012 Environment – SAP NetWeaver BW running on SAP HANA, BI 4.0 FP 3, and SAP Data Services 4.0



Business Intelligence Development Process

SAP HANA Stand-alone Environment – Stand-alone SAP HANA



Technical Highlights

Area	Focus
Sizing	Validate compression Watch your growth forecast Size based on peak usage
Upgrade and Migration	Software add-ons Data volumes Switch off SAP NetWeaver BW Accelerator before migration
Post Migration	Post migration programs Source system connections DB memory parameters for data loads DTP package setting Package size for SAP HANA optimized activation ABAP routines to be optimized for SAP HANA (few cases only)
SAP integration	Connection protocols Authentication Latest fix pack and patch

Storage Sizing – Projection

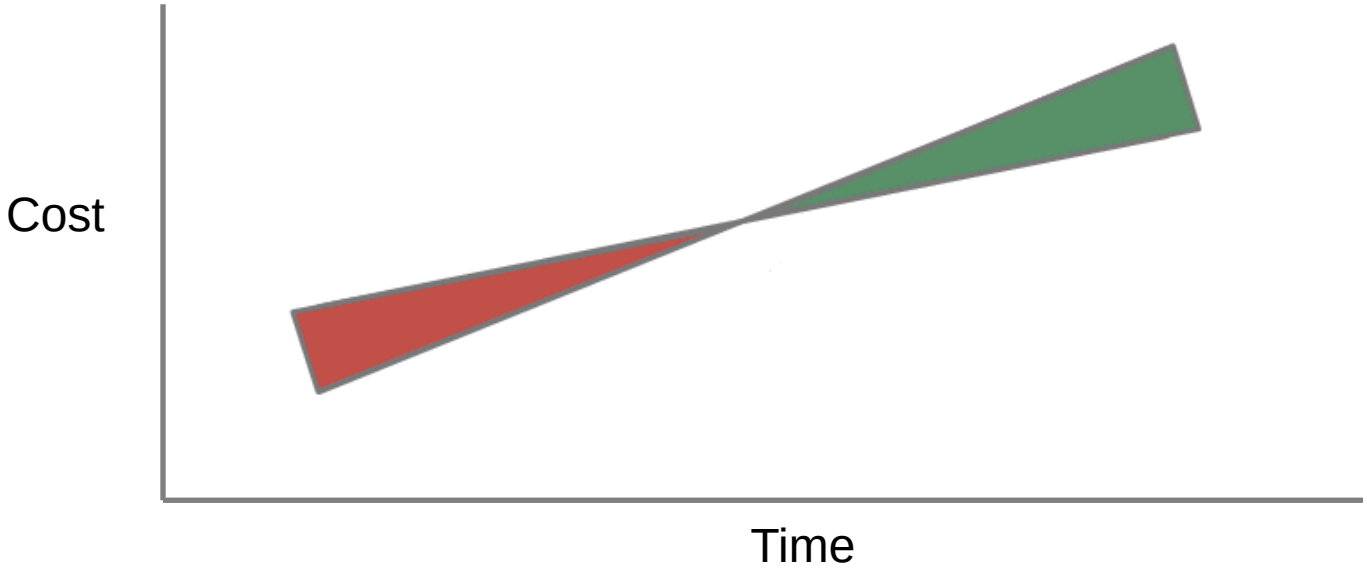
Object Type	Current Size in Legacy DB	Tighten SAP NetWeaver BW Housekeeping	Clean Up System Tables	Decommission Unused Objects	Reduce Layers	Near-line Old Data
PSA	5,842	100	100	100	100	100
Legacy DB Overhead	6,141	-	-	-	-	-
Change Log	4,174	-	-	-	-	-
DSO	1,487	1,487	1,487	1,312	1,201	1,201
System Tables	1,167	1,167	300	300	300	300
Cube	708	708	708	648	591	141
Master Data	408	408	408	408	408	408
Temp	7	7	7	7	7	7
Total	**19,934**	**3,877**	**3,010**	**2,775**	**2,607**	**2,157**
6 x	3,322	646	502	462	434	359

SAP HANA DB Compression

* All numbers are in GB

SAP NetWeaver BW Running on SAP HANA – Total Cost of Ownership (TCO)

One-time Costs / Savings	Ongoing Costs / Savings
+ SAP HANA software license	+ Software license
+ Near-line storage software and hardware	+ Growth software license
+ SAP HANA hardware	+ Hardware maintenance
+ SAP NetWeaver app servers	+ Growth hardware purchases (SAN, servers)
+ SAP BusinessObjects BI servers	+ Growth SAP HANA hardware purchases
- Potential SAP NetWeaver BW Accelerator license credit	- Labor maintenance
- Repurposed hardware (SAN, servers)	- Labor development
	+ costs - savings



Stand-alone SAP HANA – Potential Opportunities

Smart Meter Analytics

- Improve customer energy efficiency
- Improve campaign effectiveness
- Understand consumption behavior

Power Procurement

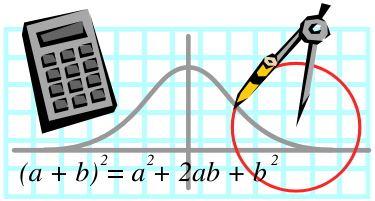
- Lower short-term power purchases
- Better forecasting
- Introduce new pricing options

Outage Management

- Reduce response time and outage costs
- Increase customer satisfaction
- Quickly analyze up-to-date outage information

Predictive Analysis

- Forecast outages, usage patterns, and cost
- Model customer segmentation
- Rapidly analyze advanced statistical models



SAP HANA – *The Game Changer*

- Much faster analytics and reporting for significant business value
- Total cost of ownership favoring the investment
- Real-time solutions for business problems
- Providing business results for new opportunities
- Increasing productivity and profitability