A Paradigm shift of Data modeling in HANA based SAP BW environment

Sundar Dittakavi, SAP COE Lead – HANA & Analytics

DAMA Houston Chapter, Feb 18th 2014
DMI Overview

Growth
- $400M Revenue (FY 2014)
- 1,700 Employees
- Inc. 500/5000 Seven years in a row

Global Footprint:
- Bethesda, MD (HQ)
- New York, NY
- Cincinnati, OH
- San Francisco, CA
- Barcelona, Spain
- London, United Kingdom
- Phnom Penh, Cambodia
- New Delhi, Chennai, Pune, India
- Mobility Innovation Center: Washington, DC
- Mobile Service Center: Chicago, IL

Certifications
- ISO 9001:2008 Certified
- ISO 27001:2005 Certified
- ISO 20000-1:2011 Certified
- CMMI Level 3 Appraised: Development and Services

DMI’s Excellence in Execution

<table>
<thead>
<tr>
<th>Performance Factor</th>
<th>Rating</th>
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<tbody>
<tr>
<td>Responsiveness</td>
<td>94</td>
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<tr>
<td>Customer Support</td>
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<tr>
<td>Personnel</td>
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<td>Business Relations</td>
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<td>Quality</td>
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<td>Delivery/Timeliness</td>
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<tr>
<td>Order Accuracy</td>
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<tr>
<td>Cost</td>
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<tr>
<td>Reliability</td>
<td>94</td>
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Our customer satisfaction is independently assessed each year by D&B Open Ratings service.

Key Partnerships

Google, Samsung, Microsoft, Apple, BlackBerry, IBM, SAP, Intel, Oracle

Awards

DMI Capabilities

**Strategic Consulting**
- Strategic Planning
- Enterprise Architecture
- Program Management
- IT Portfolio Management
- Mobile Strategy
- Integrated Cloud & Social Media Strategy

**Infrastructure Services**
- Design & Engineering
- Network Integration
- Network Operations & Hosting
- Service Desk Support
- Managed Cloud Services
- ITIL Process Implementation
- Mobile Device Management

**Application Development**
- Web-Based App Development
- App Solutions
- Enterprise Portals
- Web Services/SOA
- Enterprise Content/Data Mgt
- App & Systems Modernization
- Data Analytics/BI

**Mobility Solutions**
- Mobile Strategy
- Mobile Brand & Marketing
- Mobile App Solutions
- Mobile and e-Commerce
- Managed Mobility Services
- Mobile Analytics/BI
- Mobile Security

**Cybersecurity Solutions**
- Security Architecture
- Continuous Monitoring
- Software Assurance
- Penetration Testing
- Ethical Hacking
- System Certification & Accreditation
- Trusted Computing
- Secure Mobile Computing

**Big Data Solutions**
- BI & Analytics Strategy
- Data Mining & Manipulation
- Predictive Analytics
- Business Intelligence
- SAP HANA Implementation
- Big Data Management (EIM)
DMI BDI – Services and Solutions to help you…

**Manage Data**
Develop and execute plans, policies and programs that access, protect and enhance the value of your data.

**Leverage Analytics**
Explore meaningful patterns in your data by applying predictive and prescriptive analytical models that drive new insights and continuous learning.

**Take Action**
Expose analytics and insights to business users by embedding analytic services into business intelligence frameworks.

---

**Build Infrastructure**

**Gain Better Insights**
Explore meaningful patterns in your data by applying predictive and prescriptive analytical models that drive new insights and continuous learning.

**Make Better Decisions**
Expose analytics and insights to business users by embedding analytic services into business intelligence frameworks.

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**Achieve Better Results**
## Selected Clients

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<tr>
<th>Healthcare</th>
<th>CPG/Retail</th>
<th>Media &amp; Entertainment</th>
<th>Information Services &amp; Technology</th>
<th>Automotive</th>
<th>Manufacturing/Energy</th>
<th>Travel &amp; Hospitality</th>
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500,000+ DEVICES UNDER MANAGEMENT FOR 150+ CLIENTS; 400+ APPS DEVELOPED IN LAST 12 MONTHS
Agenda

- Need of the hour
- SAP BW solution for analytics
- Traditional SAP BW data modeling
- Overview of SAP HANA
- What changes with HANA as Database for SAP BW
- New look at data modeling with SAP BW on HANA
- Summary
- How can we help you
Need of the hour
Need of the hour

- Organizations looking for faster information availability thru faster:
  - Data storage and retrieval
  - Data processing
  - Analytics and visualizations

- What does that mean?
  - Need for efficient analytical systems
  - Need for flexible data modeling
  - Need for faster SDLC
  - Need for information anytime, anywhere

(China Railways CRH380A (Speed: 236mph))
SAP BW solution for analytics
SAP BW Solution for Analytics

- SAP’s application system for data warehousing
- Data from heterogeneous source systems
- Easy to use reporting development tools (BEx)
- Pre-built business content
- Multi Dimensional modeling
- In-built data governance scenarios
- Native scheduling and monitoring
Traditional SAP BW data modeling
Traditional SAP BW data modeling

- **Layered scalable architecture**
  - Follows EDW concept with multiple layers due to:
    - Data Volumes
    - Smaller data sets for reporting performance
    - Data load efficiency
    - Transformations, filtration, aggregation
    - Federate data from different functional areas

- **What does that mean?**
  - Complex BW environment
  - Longer Software Development Life Cycles
  - Redundant storage of data
  - Maintenance nightmare
Traditional SAP BW data modeling

Layered Scalable architecture (LSA)

- **End-user access / Presentation**
- **Reporting**
  - Main Service: Make data available for reporting & planning tools
  - Transform: Application specific/des-aggregate/lookup
  - Content: Application specific
  - History: Application specific
  - Store: IC/DSO, Info Set, Virtual Provider, Multi Provider.
- **Data Propagation**
  - Main Service: Spot for apps/Delta to app/App recovery
  - Transform: Enriched || General Business logic
  - Content: Data source || Business domain specific
  - History: Determined by rebuild requirements of apps
  - Store: DSO (can be logical partitioned)
- **Harmonization**
  - Main Service: Integrated, harmonized
  - Transform: Harmonize quality assure (in flow) || lookup
  - Content: Defined fields
  - History: Short or not at all || Long term
  - Store: Info source || IO/DSO/Z-table
- **Data Acquisition**
  - Main Service: Decouple, Fast load and distribute
  - Transform: 1:1
  - Content: 1 data source, All fields
  - History: 4 weeks
  - Store: PSA, DSO-WO.

Source 1  Source 2  Source 3  Source 4  Source 5
Traditional SAP BW data modeling

SAP BW system modeling based on RDBMS can be as complex as this

One of our mid range retail customer we helped with
Overview of SAP HANA
Overview of SAP HANA

- **What is SAP HANA?**
  - SAP’s HANA is a combined hardware and software solution
  - SAP In-Memory Database and Application platform
  - Real time information insights thru in-memory data availability
  - Pre-built in-memory optimized applications
  - Capable for combining data from heterogeneous data sources
Overview of SAP HANA

HANA solution was made possible with combination of hardware and software innovations

HW Technology Innovations:
- Multi-Core Architecture (8 x 8 core CPU per blade)
- Massive parallel scaling with many blades
- One blade ~$50,000 = 1 Enterprise Class Server
- 64 bit address space – 2TB in current servers
- 100GB/s data throughput
- Dramatic decline in price/performance

SAP SW Technology Innovations:
- Row and Column Store
- Compression
- Partitioning
- No Aggregate Tables
- Insert Only on Delta

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Ten reasons for choosing SAP HANA

1. **Speed**
   Manage massive data volume at high speeds

2. **Agility**
   Enable real-time interactions across your value chain

3. **Any Data**
   Gain insights from structured and unstructured data

4. **Insight**
   Unlock new insights with predictive, complex analysis

5. **Applications**
   Run next-generation applications

6. **Cloud**
   Step up to one of the world's most advanced cloud platforms

7. **Innovation**
   Deploy the ultimate platform for business innovation

8. **Simplicity**
   Manage fewer layers and a simpler landscape for lower costs

9. **Value**
   Innovate without disruption and add value to legacy investments

10. **Choice**
    Work with your preferred partners at every layer

Courtesy SAP
SAP HANA addresses the needs of

- High Volume storage
- High performance
What changes with HANA as Database for SAP BW
What changes with HANA as Database for SAP BW

SAP HANA helps the following in BW environments

- **Modeling**
  - Reduced materialized layers – Simplified modeling
  - Elimination of multi-dimensional structures
  - Elimination of aggregates, indexes, DB statistics
  - HANA optimization of InfoProviders
  - Reporting possible from multiple layers

- **Storage**
  - Reduction in redundancy
  - High compression of data
  - Lower TCO due to lean layers

- **Performance**
  - Faster reporting performance
  - Agile development life cycles
  - Faster Data loads

- **Newer Horizons**
  - BW and non-BW data mixed scenarios
  - Consolidated data thru Smart Data Access (Teradata, Hadoop, Sybase..)
From traditional SAP BW to SAP BW on HANA

Traditional SAP BW on RDBMS needs multiple layers of data storage for reaching to the minimal data set for faster reporting.

SAP BW on HANA provides reporting functionality at multiple layers.
Hana optimization of InfoCubes

**SAP BW on RDBMS**

- MD – Master Data Table
- D – Dimension Table
- Facts: E – Compressed Fact Table
  - F – Un-Compressed Fact Table

**SAP BW on HANA**

- MD
- D
- Facts
- F
Hana optimization of DSO objects

DSO activation moved to in-memory
Away from multi-dimensional modeling!

InfoCube can be removed when used for query performance only
Multi Temperature data in SAP BW on HANA

<table>
<thead>
<tr>
<th>hot</th>
<th>warm</th>
<th>cold</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Data is read and/or written frequently</td>
<td>• Infrequent access</td>
<td>• Sporadic access</td>
</tr>
<tr>
<td>• In memory</td>
<td>• On disk, no need to keep in memory all the time</td>
<td>• Not stored in HANA DB; stored in Near-line Storage</td>
</tr>
<tr>
<td>• No restrictions, all features available</td>
<td>• No restrictions, all features available</td>
<td>• Restricted to NLS capabilities</td>
</tr>
</tbody>
</table>

Tables/partitions in SAP HANA can be marked as “non active”

BW automatically marks all PSA tables and all write-optimized DSO tables as “not-active”, no extra maintenance or tuning is necessary.
Advantages of SAP BW on HANA

<table>
<thead>
<tr>
<th></th>
<th>Classic Approach (BW on RDBMS)</th>
<th>In-Memory Approach (BW on HANA)</th>
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<tbody>
<tr>
<td>Business User Dissatisfaction</td>
<td>Slow Reporting Performance Indexes, aggregates and query tuning</td>
<td>Very Fast Reporting No Indexes, aggregates, tuning</td>
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<tr>
<td></td>
<td>Need BWA</td>
<td>No BWA required, all objects</td>
</tr>
<tr>
<td>Real-Time Data Access</td>
<td>Latency 24 hours typical</td>
<td>Real-Time Data Access Real-Time data replication</td>
</tr>
<tr>
<td>Planning Performance</td>
<td>Planning Speed Slow Limit data, or frequency, or granularity</td>
<td>Plan More and Faster Calculations done in-memory</td>
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<tr>
<td>Data Loading Performance</td>
<td>Slow and Difficult 8-12 hour load times typical</td>
<td>Superior Loading Staging and transforms in-memory</td>
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<tr>
<td>IT Maintenance/Responsiveness</td>
<td>Heavy RDBMS Management Indexes, Statistics, DBA operations</td>
<td>Simplified Maintenance No indexes, statistics needed</td>
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<tr>
<td>Modeling</td>
<td>Inflexible Non-trivial exercise to add/remove dimension, or remodeling cube</td>
<td>Modeling Flexibility No materialized layers makes modeling very agile and fast</td>
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</table>
New look at data modeling with SAP BW on HANA
New look at data modeling with SAP BW on HANA

- No need of objects in multiple levels
- No need of aggregates, indexes for query performance
- Categorize data into cold, warm and hot
- Leverage Smart data access for virtual links to non-sap data
- Re-visit scenarios not possible in the past
- Open up analytical environment with structured and unstructured data
Summary
Summary

- Leaner data modeling with reduced layers
- Data load and reporting performance improvements
- Flexible data modeling scenarios
- New frontiers for business analytics
- Agile software development life cycles
- Lower TCO and maintenance
How can we help you
# How can we help you

<table>
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<tr>
<th>Business case identification</th>
<th>Pre implementation review and planning</th>
<th>HANA for SAP BW</th>
<th>HANA for Business Suite</th>
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<tbody>
<tr>
<td>HANA for non-SAP</td>
<td>HANA migration assessment</td>
<td>SAP BW Modeling review</td>
<td>Modeling best practices</td>
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<tr>
<td>HANA/BOBJ BI integration</td>
<td>Customer Proof of Concepts</td>
<td>HANA system sizing</td>
<td>Hardware/Cloud recommendation</td>
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<tr>
<td>SAP HANA Rapid Deployment solutions</td>
<td>HANA installation and configuration</td>
<td>HANA Security and Administration</td>
<td>HANA technology training</td>
</tr>
</tbody>
</table>
DMI - SAP HANA Centre of Excellence

Service Offerings

Strategic

Tactical

Operational

Training

Domain Specific Offerings

Customer centric offerings

Certified professional resources

SAP Partners

In house lab for
- SAP HANA
- SAP BW
- SAP Business Objects
- SAP Data Services
- SAP ECC
- HADOOP

Technology trends tracking

Highly skilled resources in latest technologies

POC & Prototype development

Partners with SAP for presales & Implementations

Technology expert community

Participate in technology forums

Access to partner knowledge

Presentations, Blogs and news letters

Internal knowledge sharing sessions

Central repository of knowledgebase
Thank you for your time.

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www.dminc.com
Appendix
BDI Offerings

- Strategic Consulting
- Platform as a Service
- Analytics as a Service
- Pre-Packaged Solution
- Business Intelligence
- Analytics
- BI Strategy/Roadmap
- Training
- BI Center of Excellence

- BI Platforms (End to end implementation)
- M2M
- BI on web
- Hosting
- BI & SAP HANA
- Visualization

- Predictive Analytics
- Data mining
- Data Monetization
- Mobile App Analytics
- Segmentation
- MDM Analytics
- Descriptive Analytics
- BI AMS

- PriceGuide
- Mobile Engage
- Analytics Rx
- Business Insights
- Loyalty Analytics
- MU Mentor
- Producer Guide
Capabilities Overview

**Infrastructure**
- SSO
- Web/App Server
- Host Architecture

**ERP**
- SAP
- Oracle
- SalesForce.com
- JDE

**Database**
- Oracle
- SAP HANA
- IBM
- Microsoft

**Portal**
- Java, .NET
- Mashups
- Portals

**BI System**
- SAP/BOBJ
- Oracle
- Microsoft

**ETL**
- BOBJ DI
- Informatica
- Oracle ODI, OWB
- Microsoft SSIS

**Predictive Analytics**
- SAS
- SPSS
- WPS
- R
Pre-Packaged Solutions - What is in the package?

• Data Model and Data Integration scripts
• Pre-built Statistical Models
• Pre-built reports and dashboards

Data Architecture

- Clients
- Producer
- Comp rules
- Orders
- Products
- Market Data

AnalyticsEngine™

Contribution Model
- Business Drivers
- Micro level insights

Peer Benchmarking
- Customer Segmentation
- Evaluate margin headroom

Attrition Alert
- Attrition Modeling
- “At risk” client/Producer list
- Price Sensitivity

Re-Pricing Alert
- Upside modeling
- Reasonable price increase

Cross-sell opportunity
- Product propensity modeling
- Next Best products
- Pricing scenario builder

Dashboards & Reports

<table>
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<tr>
<th>Segment Benchmark Report</th>
<th>Re-Pricing Report</th>
<th>Upside Report</th>
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Web/Mobile

- [Images of web/mobile dashboards and reports]

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## Capabilities Matrix

<table>
<thead>
<tr>
<th>Services</th>
<th>Installation and Upgrades</th>
<th>Migration</th>
<th>Solution - Proof of Concept</th>
<th>Modeling</th>
<th>Architecture &amp; Design</th>
<th>Development and Testing</th>
<th>Performance Tuning</th>
<th>Training &amp; Knowledge Transfer</th>
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<td>Reporting and Dashboards</td>
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Thank you for your time.