The SAP Business Information Warehouse for Data Warehouse Professionals

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About the Speaker

- Founder and CTO of Information Frameworks, an author, speaker and world-renowned expert on emerging eBusiness Intelligence Technologies.

- A catalyst in defining technical architecture of SAP BW and several other Data Warehousing products.

- Author of best selling book titled, *SAP Business Information Warehouse for SAP*.

- Member of Intelligent ERP magazine's board of editors, is a frequent speaker at IT industry conferences including SAP TechEd, ASUG, Oracle Open World, DCI, The ERP World, and the Data Warehouse Institute.

- 24+ years of experience in emerging Information Technology research, development, and management, information delivery architecture; e-business; ERP applications; data warehousing; data mining; CRM; database, Web, object and client/server technologies; Enterprise Application Integration; and information architectures.

- Email- nhahsni@infoframeworks Web Site: http://infoframeworks.com
Topics

• What is SAP BW?
• Why it is important to know SAP BW
• Evolution of ERP Centric Data Warehouse
• Data Warehouse Building Blocks
• SAP BW and Corporate Information Factory
• SAP BW Architecture: OLAP – ODS – Hub and Spoke – Data Warehouse
• Data-warehouse life cycle in BW: requirements gathering to implementation
• Performance and scalability of BW
• Resources
• Q&A
Today – A New World!

“Thank you everybody’s using the technology.”

Source: The Computer World, July 2000
Callout: Naeem Hashmi
The Near Future…

Let me check
Banker’s giving
History
In the Near Future...

Wow. Banker must be in a good mood today. Donations were much higher than the past 3 years! Gee.. Thanks
In the Near Future...

I should e-mail his Tax attorney a Tax Deduction Form.
In the Near Future…

BUT! First, let me also check Banker’s donations to others compared to me!
In the Near Future…

That’s not good news! He is giving more to others sitting around the corner.
In the Near Future…

But Why!
In the Near Future...

What am I doing wrong?
Am I not dress well? 
or Am I not cute? 
or
In the Near Future...

What am I doing wrong?
Am I not dressed well?
or
Am I not cute?
or
My Intelligence Service Provider is not sending me right information
To target right donors at the right place at the right time?
In the Near Future…

A big cultural change –
Providing business intelligence services to masses.
An extremely complex task to implement
Business Intelligence-aware environment
What is SAP BW?

- An ERP Application
- Data Mart for SAP ERP
- Data Warehouse for SAP only
- Enterprise Data Warehouse
- A Business Intelligence Solution
- mySAP.com
- mySAP Business Intelligence
- SAP BW

Source: SAP
Why It is Important to know SAP BW?

- SAP Customers: 19,000 plus world wide
- Most SAP Customers will end-up using BW in one shape or form
- Non-SAP customers are also investigating BW
- SAP consultants lack Data Warehouse knowledge
- Data Warehouse consultants lack SAP knowledge
- Next generation of Business Intelligence Solution
- A good opportunity to jump into this hot area!
Cultural Issues for DW Professionals

- Data Warehouse Design is not DB focused or SQL centric
- Less focus on DB modeling – more on Business Solution
- Solution rather Product Approach – new methodology
- Platform Independence – Database – Hardware – OS
- Distributed and heterogeneous deployment model
- Data Loads API based – No DB bulk loading facilities or SQL Stuff
- Data Access API based – no direct DB access for reporting or OLAP analysis
- Not just a Data Warehouse rather an Information Management Framework for Business Intelligence and eBusiness Critical applications - Same Infrastructure
- **Closed Loop** Integration with business operations
Different Implementation Methodology

- Hybrid of Ralph Kimball and Bill Inmon approach
- Very much tied down with SAP R/3 road-to-production life cycle - very much Solution Focused
- Requires tight link with Business Strategic planning, Business Architecture and the ERP OLTP Instance Configuration

- ASAP Methodology for BW:
  - Project Plans
  - Accelerators
  - Guides
  - Whitepapers

Source: SAP
New Lingo for DW Professionals

- SAP Business Apps.
  - FI, SD, MM, COPA…
- LIS, SIS, FIS …
- ABAP/4, BASIS, BAPI…
- ALE, IDOC, TRFC…
- Statistical Update
- Global Metadata
- Configuration
- Correction and Transport
- Deployment Landscape
- Multi-Language
- Multi Currency
- Business Content
- InfoObject
- InfoSource
- InfoCatalog
- InfoCube
- InfoSpoke
- InfoPackage
- ODS
- PSA
- Versioning
- Activation
- …
Business Intelligence Building Blocks

Business Intelligence is an umbrella term, introduced by Howard Dresner of the GartnerGroup in 1989 to describe a set of concepts and methodologies to improve decision making in business through the use of facts and fact-based systems.

Business Intelligence Applications

- Executive Information Systems
- Decision Support Systems
- Enterprise Information Systems
- Management Support Systems
- OLAP (On-Line Analytical Processing)

- Balanced Score Cards

as well as newer technologies such as:

- Data Mining
- Data Visualization
- Geographic Information Systems
Evolution of ERP Data Warehousing
Data Warehouse Building Blocks

Data Warehouse Services

INFORMATION PROVIDER

SERVICE PROVIDER

DATA PROVIDER

Data Sources

Information Consumers

Governing Services
- Track Resource Utilization
- Audit and Controls
- Scheduling

Client Profile

Multi/Tiered Models

Warehouse Operations

Source/Target Management

Data Dictionary

Development Management

Hardware/Software

Security

Metadata

Information Presentation
- Search Engines
- Client data synchronization
- Data Conversions

Information Access APIs

Consumer Profiling

Global catalogues

Information Delivery

Application Integration
- Data Distribution
- Data Profiling
- Data Partitioning

Information Authoring

Data Consolidation

Data Staging

Data Storage

Data Transport

Data Transformation

Data Cleansing

Data Extraction

Subject Models
SAP BW – Information Flow

- Scheduler
- Metadata Repository
- Monitor
- Staging Engine
  - ODS
  - PSA
- Transfer Rule
- InfoSource
  - Communication Structure
  - Update Rule
  - InfoCube

Request
- Info Receipt
- Info Packet
- Info Finished

DB Link
- Flat File
- 3rd Party Tools
- Staging BAPI

ALE
- CRM
- APO
- ... SEM
- BW

ANALYTICS

R/3
- Extraction Engine
  - Transfer Structure
  - Extraction Structure
  - Function Module (API)

XML

Naeem Hashmi
The Data Warehouse Institute November 8, 2001 The SAP Business Information Warehouse for Data Warehousing Professionals

SAP BW and the CIF

Architecture

SAP BW

- **Data Stores**
- **Processes**
- **APIs**

CIF

- **Data Stores**
- **Processes**
- **APIs**

**Processes**

- Admin Workbench
- Metadata Repository
- OLAP Processor
- Staging Engine
- InfoCubes
- ODS
- PSA

**APIs**

- BAPI
- PSAP

**Data Stores**

- ODS
- NRTS
- DW

**File**

- Provider
- SAP BW

- Business Intelligence Applications
- Data Sources - OLTP Applications
- Data Acquisision
- Data Delivery
- Metadata

- Data Warehouse Management/Operations
- Analysis/BI Applications
- Other Applications
SAP BW and the CIF

Architecture

SAP BW

- Data Stores
- Processes
- APIs

CIF

- Metadata Repository
- Staging Engine
- OLAP-Processor
- InfoCubes
- ODS
- PSA

Processes

APIs

Data Stores

Copyright Information Frameworks
mySAP Business Intelligence and CIF

<table>
<thead>
<tr>
<th>Data Sources</th>
<th>Data Warehousing</th>
<th>Business Content</th>
<th>Analytics</th>
<th>Information Delivery &amp; Presentation</th>
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<td>KPI</td>
<td>CRM</td>
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<td>Management</td>
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</table>
mySAP Business Intelligence and CIF
What is SAP BW Business Content?

- Business Content
  - SAP BW 2.0B
  - Metadata
    - Role
    - Workbooks/HTML
    - Queries
    - InfoCubes
    - Extractors, InfoSources
- InfoObjects
- Quantity
- Product

Extraction:
- R/3
- APO
- EBP
- CRM
- Market Set 3.0

Source: SAP

190+
900+
900+
260+
700+
4300+
SAP BW – Multi-Dimensional InfoCube

- Relational OLAP (ROLAP)
- Extended Snow-flake Schema
- Shared-Dimensions
- Multi-Cube Joins
- 16 Dimensions per InfoCube
  - Master Data
  - Multiple Text Support (multi-language)
  - Multiple Hierarchies

- Pure MOLAP on Microsoft Analysis Services for SAP BW 3.0x on pure Microsoft SAP BW Platform
SAP BW – Operational Data Store -ODS

- The term ODS in SAP BW is not what you think of an ODS
- In SAP BW, the ODS is a Data Management Framework to define, build and manage Physical Data Stores to construct:
  - Data Staging Environment
  - Class II, Class III, Class IV ODS
  - Enterprise Data Warehouse
  - Standard Reporting Environments
  - Real-Time – Enterprise-Application-Integration Hub – ODS Class I
  - Data Archives
  - ...
SAP BW – Loading Data

- Native Mode
  - Application Link Enabling
  - Transactional RFC (tRFC)
  - Flat Files
  - DB-Link (Oracle, Microsoft SQL Server)
  - XML (BW 3.0x)

- Third Party
  - Staging BAPI
  - Certified Vendors

- Use native modes as much as possible
- 3rd Party ETL tools are viable options. Exploit existing ETL tools to build flat files for BW to load data. Data loads via flat files is much faster than directly loading using 3rd Party ETL Tool Staging BAPI Interface.
SAP BW – Accessing Data

• Native Mode
  – Business Explorer - BEX
  – WEB Publications, WEB Query (BW 3.0x)
  – XML (BW 3.0x), WAP
  – InfoSet Query

• Third Party
  – OLE DB for OLAP BAPI
  – OLAP BAPI
    • http://infoframeworks.com/bw/sap_bw_3rd_Party_Access_ETL_tools.htm

• The Native BEX Environment is not very robust (MS Excel based)
• The third party data access tools do work with BW but often have performance and connection problems.
• SAP Portal Integration with BW is great but make sense if SAP Portal is your primary Enterprise Portal
SAP BW – Extracting Data from BW

- **InfoHub (BW 3.0x)**
  - Extract Data from SAP BW
  - XML

- **3rd Party ETL Tools**
  - Just about all can be used to extract data from SAP BW
  - SAP does not provide any certification process or API to extract data from SAP BW

- **Data Archive**
  - Extraction
    - ADK – Native to SAP Archiving Software
    - 3rd Party Certified Tools Integration for Archiving
  - Loading
    - Also load data from SAP R/3 Archived Data
How Data Quality is Managed in BW?

- Data Quality/Assurance Support at all levels:
  - Data extraction
  - Staging Process
  - Data Load Process
  - Verification/Validation
  - Consistency in Data Stores
  - Rollback

- Data Quality/Management is mostly done through:
  - Look-up Tables
  - ABAP scripting/coding
  - No Built-in Schemes for advanced data quality functions like 3rd party tools such as offered by Vality.
SAP BW - Data Mining  (BW 2.1C P9+)

- Supported Algorithms
  - Decision Trees
  - Scoring
  - Clustering/Segmentation
  - Association Analysis

- Create a mining model
- Train the model
- Predictions using Training results
- Using the data mining results against BW Query
SAP BW - Data Mining (BW 2.1C P9+)

- Good first attempt to implement a few Data Mining Algorithms – Customer Focused
- Analytics limited to mySAP CRM
- Very traditional Data Mining Approach
- Requires a well versed Statistician or Data Mining Expert to model and interpret the results
- Source: BEX Query – Big Limitation in DM
- Very poor in Visualization and Knowledge Interpretation
- No Integration with OLAP environment other than BEX to do slicing and dicing
SAP BW - Exploration Data Warehouse?

MS Analysis Services
SAP BW 3.0A
PolyVista

Source: Microsoft
SAP BW – Quality/Testing Environment

- SAP Computer Aided Testing Tool (CATT)
  - Built in SAP BASIS, SAP GUI based functional and volume testing tool. eCATT on the drawing board.

**Repository** of all test cases
**Object related**

**Selection** for a special purpose
**Project related**

**Linkage** of test cases to tester
**Person related**

**Test package**
Test Case 1
Test Case 2
Test Case 3

**Test** execution

Test Case 1
- What?
- How?
- Result?
- Status?
SAP BW Quality/Testing Environment

ASAP for BW

Outlines test plans for Transport and Corrections - BASIS level - but does not address in details what, where and how to test Analytics.

SAP does not provide any test scripts (CATT) for Business content validation.
SAP BW and the Enterprise Applications

Enterprise Business Steering Committee

SAP R/3 Program

Corporate Data Warehouse Program

Corporate Information Architecture & Technology Program

ERPERP

CRM

eBusinesseBusiness

LEGACY

ERP

Business Processes

FI FI Mfg. Mfg. SD SD HR HR

EIA

EAI
SAP BW Analytics Scope

1. **Intra-business-process** - Real-time business-events integration
   - B2B: Credit verification, Orders - new/changed, etc.

2. **Operational** - enable the user to maintain control over day to day transactions
   - Overdue Orders, Orders on Hold, Released sales orders, stock inventory

3. **Management** - assist in analysis or measurement based on key performance indicators/metrics of the business, KPI, Balanced Score Cards
   - Orders and Backlog reporting, Profitability Analysis, Variance Analysis (performance vs. plan)

4. **Enterprise Wide Reporting and Analysis**
   - Historical trends, across Multiple Business Units, Data Mining
     - Power Users for long term Business planning, Proft Trends, Strategic Planning, Legal Reporting

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SAP BW – Lesson Learned

- SAP BW is not a Technology Project
- Get an executive level support for BW pilot/project
- You will face cultural issues (SAP/DW organizations)
- Do not start from scratch for every thing like typical Data Warehouse Project
  - Exploit the Business Content (FI, SD, MM - rich and mature)
  - Extend the Business Content
  - Custom develop your own from scratch
  - Analytics limited to mySAP CRM
- Do not force fit every thing in InfoCube
  - balance OLAP and Non-OLAP data sets in BW
- Stay aligned with SAP R/3 OLTP Project plans
- Do not let SAP Consultants make all the decisions – involve your own DW team members in your project.
Welcome to the World of

SAP Business Information Warehouse

The SAP Business Information Warehouse is a next generation of information management framework to implement global deployable closed loop business intelligence solutions and the Extravise Information Factory.

The BW WORLD content is broad and covers broad range of topics that relate to SAP Business Information Warehouse as well as other elements that relate to ERP Centric Data Warehousing.

The following introductory documents provide you basic understanding of SAP Business Information Warehouse. These are must read.

- Business Information Warehouse - 101
- How SAP BI is revolutionizing Decision Support, Data Warehouse
- SAP Business Information Warehouse: The Road to Intelligent
- Is SAP Business Information Warehouse an Open Solution?
- Glossary of SAP BW and Traditional Data Warehousing

http://infoframeworks.com
Questions

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