BI Accelerator: Case Study of Retail Industry
NYOUG Annual Day 2008

Forrest Snowden
Shyam Varan Nath
Deloitte Consulting LLP
September 10, 2008
# Agenda for Today

<table>
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<th>Speaker One</th>
<th>Speaker Two</th>
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<tr>
<td>Forrest Snowden (Overview of RBIA)</td>
<td>Shyam Varan Nath (Technical Details of RBIA)</td>
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About – Forrest Snowden

• Deloitte Consulting LLP, Senior Manager, Information Management

• Retail:
  - 6 years at the DeMoulas/Market Basket to put myself through college, 1980-1986
  - Dixons Store Group (largest UK retailer), 2005-2006
  - Wal-Mart, 1999

• Consulting: 22 Professional Years of Experience (16 years in Consulting)
  - General Manager, Command Information (A Carlyle Group), 2005-2007
  - Head of UK DW/BI Practice, Sr. Mgr. KPMG/BearingPoint, 1999 - 2006
  - Sr. Product Manager, IBM, WebSphere Payments
  - Sr. Quality Engineer, Raytheon Missile Systems Division, 1986-1991

• Clients:
  - Pfizer, Lafarge, Citigroup, Chase, Baxter Health Care, BCBS, Lafarge

• Education:
  - Babson College, MBA
  - Tufts University, BSEE
Trends in the Retail Sector

- We are beginning to see emergence of the next generation of retail analytic solutions for areas such as merchandising, pricing, ...
- We are on the cusp of a wave of Multi-channel retail transformation efforts
- Transformation will be big, intrusive and invasive to the current operations of large retailers
- On-Line retailers may begin to recognize the benefit of select physical locations
### Key Business Issues

**Key issues:**

- How should retailers improve pricing, promotion and merchandising practices with the help of technology?
- How can retailers leverage business intelligence and analytics to grow their businesses?
- Remain competitive

### Answers: Retail BI Accelerator

- Leverage pre-built software known as an accelerator
- As an example, harness the power of a market ready retail BI Accelerator that’s integrates with your DB and BI tools
Value v/s Generation Steps in Analytics

Intelligent Interactions (Data Mining)
- Is the product assortment optimal for all my regions?

Fact-Based Actions (OLAP, Statistics)
- What are my potential out-of-stock situations?

Performance Management (KPI, Guided Analytics)
- How is the business doing compared to last year? Compared to plan?

Slice/Dice, Ad-hoc, Query, BI Tools
- What is my gross margin return on space?

Transactional Reporting
- How are my catalog and internet sales performing?

Generation Steps
1. Reporting
2. Analysis
3. Forecasting
4. Predictive
Technology Layers

- Layered BIDW stack to use the advanced analytics
The Value of a Retail Accelerator

- **Rapid ROI.** With its low cost of entry, fast implementation, measurable impact on costs and productivity

- **Pre-built.** Start with pre-built BI reports and dashboards incorporating the industry leading practices on top of Industry Standard Reference Data model (ARTS)

- **Oracle Products.** Oracle components like OWB, Oracle Data Warehouse, OLAP, Data Mining and OBIEE in combination with Retail Industry
Reference Data Model - ARTS

- Association for Retail technology Standards provides ARTS - the standard based data model for retail industry
  - Not restricted to DW alone. Can be used for SOA, ODS or other data integration effort
  - Relevant (up-to-date) for retailers needs
  - Repository driven
- ARTS data model applies to different segments of retail industry
ARTS Retail Subject Area Composition

- The ARTS Retail Data Model currently supports the following business areas:
  - Merchandise flow management
  - Inventory management
  - Item and price maintenance
  - Point of sale processing
  - Tender control
  - Store administration/operations
  - Customer relationship management
  - Sales and productivity reporting
  - Ordering (partially supported)
  - Workforce Management (partially supported)
RBIA Architecture
RBIA Technical Overview
About – Shyam Varan Nath

• Specialist Master in Deloitte Consulting – Technology Integration, Information Management Practice
• Skills in Oracle BI, DW, Data Mining etc
• Certified DBA – OCP on 4 different RDBMS versions since 1998
• Spoke in NYOUIG in 2006 (Quarterly and Annual Day), was part of Oracle Corporation – BI Consulting Practice
• Speaker in IOUG/Collaborate, Oracle Open World
• Founder and President of Oracle BI, Warehousing and Advanced Analytics, SIG or Oracle BIWA SIG
• Other Industries – Telecomm, Healthcare, Banking/Finance, Law Enforcement
• Bachelor’ in EE from Indian Institute of Technology (IIT Kanpur)
• Masters – MBA and MS in Computer Science (Florida Atlantic University, Boca Raton, FL)
Welcome to the Business Intelligence, Warehousing and Analytics Special Interest Group (BIWA SIG) Website!

Add the BIWA Summit, Dec 2-3, 2008, at Oracle’s World HQ, to your calendar!
For BIWA Summit ’08 details, click on the Summit tab above.

Oracle BIWA Summit 2008 is a forum for business intelligence, warehousing and analytics professionals to exchange information, experiences and best practices.
Gain the knowledge and information critical for success in your work.

All This at One 2-Day Event at Oracle Headquarters! Click on the Summit 2008 tab above for details.

- Keynote Addresses
  - Jeannie Harris - coauthor of bestselling book Competing on Analytics
  - Director of Research
  - Accenture Institute for High Performance Business
  - Juan Loaiza - Vice President of Systems Technology Group, Oracle Inc.
  - Ray Roccaforte - Vice President of Data Warehousing and Business Intelligence Platform, Oracle Inc.
  - Usama Fayyad - Chief Data Officer, Yahoo Inc.

- Hands-On Workshops
- Solution Showcase
- Solution Providers Sessions
- ...And Much More!

- 3 Tracks of Technical Talks with More than 75 sessions running in 5+ parallel rooms

- Meet the Oracle Experts
- Analyst/User Panel Discussions
New IOUG Award Is Double Honor

By Ari Kaplan

From the Oracle Contribution Award to Ken Jacobs to Tom Kyte

It's not often that a single award can honor two people, but that's what the Independent Oracle Users Group (IOUG) has done with one award this year.

The Oracle Contribution Award has been one way that the IOUG has recognized extraordinary contributions by Oracle employees to the user group and the user community. Each year at the annual COLLABORATE conference, which is cosponsored by the IOUG, the Oracle Applications User Group, and Quest, the IOUG has presented this award to an Oracle employee for outstanding dedication and service to the user group community.

Through this award, the IOUG has acknowledged people who have positively affected the success of the IOUG through their support of the organization. Recent recipients of the Oracle Contribution Award include Shyam Varan Nath (2007), Mary Lou Dopart (2006), James Hobbs (2005), Ken Jacobs (2004), Mary Ann Zirelli (2003), and Kate Knerer (2002).

The IOUG Is Pleased to Rename...

The IOUG has renamed the Oracle Contribution Award after Ken Jacobs, Oracle's vice president of product strategy in Oracle Server Technologies, for his many contributions to Oracle users. The years that Ken Jacobs has provided support, strategic guidance, and leadership to the IOUG have truly made a mark on our organization, and we very much appreciate all that he has done for the IOUG.

Jacobs has had an extensive career with Oracle, including helping to establish the first Oracle office in Washington DC in 1981; serving in various consulting, support, product management, and product marketing capacities; and helping to guide the development of the Oracle Database product over the years.
The Product Includes:

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<th>Industry Specific DW Content</th>
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<tr>
<td>✓ Pre-built DW with 650+ Tables and 10500+ attributes</td>
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<tr>
<td>✓ Pre-built OLAP Cubes (15+)</td>
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<tr>
<td>✓ Pre-built Data Mining Models (10+)</td>
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<tr>
<td>✓ Pre-built Reports (320+) with Role based Dashboards</td>
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<tr>
<td>✓ Intra ETL using OWB</td>
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<tr>
<td>✓ Leveraging 10gR2 DW features including Statistics &amp; Advanced SQL</td>
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<th>Oracle Tech Stack</th>
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<tr>
<td>✓ Database 10GR2 EE With Options: Partitions, OLAP, Data Mining</td>
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<tr>
<td>✓ Oracle Designer</td>
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<td>✓ OBI EE</td>
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<th>Database EE 10g.R2 Platform</th>
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<td>Role-Based Dashboard</td>
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<tr>
<td>Retail BI Warehouse Data Model</td>
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<tr>
<td>Oracle Database 10g (Enterprise Edition)</td>
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<tr>
<td>OLAP</td>
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<td>Data Mining</td>
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<td>Partitioning</td>
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<td>RAC</td>
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Base Data Model – Third Normal Form

**POS System (ARTS 5.0 Compliant)**
- Control: Internal Transfer, Security
- Retail: Sale Return, No Purchase, Tender, Till
- Store Financial: Tender Deposit/Loan/Pickup
- Transfer, Receipts
- Reference to Customer Order

**Order Management**
- B2C & B2B: Reference to POS
- Back Office State:
  - AB°C: Fulfillment, Shipping, Partial Shipment, Delivery
- Front Office State:
  - Create, Add/Change/Delete
  - Pickup, Partial Pickup, Return, Layaway

**Inventory**
- Receipts, Requisition, Transfer, Return
- Inventory State
  - On Hand, On Order, On Layaway
  - Damaged, To Be Returned
  - Shrinkage

**Merchandising & Category Mgmt**
- Movements, Space Allocation, Shrinkage
- Syndicated Data, Clustering
- Mark Up/Down, Clearance

**Events & Promotions**
- Events, Campaign, Media, Launch
- Creatives, Message, Depiction, & Rendering

**Planning & Budgeting**
- Merchandise &
- Category Sales Plan
- Stores Sales Plan
- Promotions Sales Plan, Budget
- Marketing Budget
Aggregate Data Model (Facts and Dimensions)

- **Retail Sale, Return, Tender, Markdown, Till**
  - Day/Week @
  - Item/Subclass/Dept
  - Employee/Touch Points
  - Override, Discount
  - Time Series
  - Flow Analysis
  - POS, Tender

- **Inventory Position**
  - Day/Week @, Item/Subclass/Dept
  - Out-of-stock, Zero Selling
  - Forecast
  - Time Series

- **Merchandising Category**
  - Scorecard
  - Items, Employee, Customer, Frequent Shopper
  - What-if
  - Forecast & Time Series

- **Actual vs. Plan**
  - Forecast & Time Series
  - Merchandise & Category
  - Stores Sales Plan
  - Promotions

- **Customer Order**
  - Day/Week @ Item / Subclass / Dept
  - Employee / Touch Points

- **Events & Promotions**
  - Actual vs. Plan vs. Updated Plan
  - Contribution:
    - Campaign, Media
    - Message, Rendering
  - Forecast & Time Series
  - RFMP, Migration
Derived Data Model (Data Mining)

- **Retail Sale, Return, Tender, Markdown, Till**
  - Day/Week @
  - Item/Subclass/Dept
  - Employee/Touch Points
  - Override, Discount
  - Time Series
  - Flow Analysis
  - POS, Tender

- **Inventory Position**
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- **Events & Promotions**
  - Actual vs. Plan vs. Updated Plan
  - Contribution:
  - Campaign, Media
  - Message, Rendering
  - Forecast & Time Series
  - RFMP, Migration
## Pre-built Advanced Analytics

### Mining Model

**Clustering Algorithm**
- Item basket
- Associate basket
- Customer bundle
- Frequent shopper
- Customer bundle

**Classification / ABN**
- Store loss
- Associate loss
- Item POS loss
- Associate Sales

**Decision Tree**
- Price Elasticity
- Customer Price
- Elasticity

### OLAP Model

**Times Series**
- POS Flow Analysis
- In-store Sales
- Tender & Till

**Forecasting**
- Out-of-Stock
- Store Compensation
- Promotion Analysis
- Cost & Contribution
- Sales & Margin

**What If**
- Loss prevention
- Transaction Analysis
- Shrink Analysis
- Customer Value
- Frequent Shopper
- Customer RFM

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Screenshots and Demos

WALLY IN MARKETING

Wally, I want you to design our sales collateral.

THE TRICK IS TO COMPARE OUR PRODUCT WITH THINGS THAT ARE EVEN WORSE.

“PRETTIER THAN A SKUNK SANDWICH AND COOLER THAN A HOBO’S MITTENS.”

© Scott Adams, Inc./Dist. by UFS, Inc.
Login to the RBIAA
RBIA - OBIEE Screens
Loss Prevention – Shrink & Theft
Typical Problems Addressed by ODW-R

- Determining how are my catalog and internet sales performing?
- Determining what is my gross margin return on space?
- Determining how is the business doing compared to last year? Compared to plan?
- Determining what are my potential out-of-stock situations?
- Determining if the product assortment is optimal for all my regions
  - Retaining customers and avoiding churn
  - Profiling customers to understand behavior
  - Finding rare events
  - Maintaining and improving profit margins
  - Targeting customers with the right offer and thus reducing customer acquisition costs
1. Install Oracle software—DB and BIEE.
2. Install ODWR (OUI part)
3. Post-Installation (OLAP, OWB)

Installation creates in BIA_RTL schema:
- Physical tables (base/reference/lookup/derived)
- Materialized Views (for aggregate)
- Views
- MV Logs for Materialized Views
- Indexes
- Primary Foreign Key constraints
- Sequences
- Intra-ETL from Base to Derived & Aggregate
Install - Screenshots

Select Installation Type
ODWR 10.2.1.0.0

What type of installation do you want?
- Relational (154MB)
  Install the relational component of ODWR.
- Relational and Mining (186MB)
  Install both relational and mining components. Requires Oracle Data Mining database option.
- Sample Schema and Reports (454MB)
  Install sample schema with demo data and sample reports.

Summary
ODWR 10.2.1.0.0

Global Settings
- Source: /scratch/cdaniels/view_storage/cdaniels_rbia_ade/rbia/install/ship/Downloads/Linux/Disk1/
- Oracle Home: /tia ora/test2 (RBIAdest2)
- Installation Type: Relational

Product Languages
- English

Space Requirements
- 170MB (includes 13MB temporary) available: 112.55GB

New Installations (/products)
- Oracle One-Off Patch Installer 10.2.0.3.0
- Oracle Universal Installer 10.2.0.3.0
- ODWR 10.2.1.0.0
- ODWR Relational 10.2.1.0.0

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Install – OLAP and Mining

Select Installation Type
ODWR 10.2.1.0.0

What type of installation do you want?
- Relational (154MB)
  Install the relational component of ODWR.
- Relational and Mining (186MB)
  Install both relational and mining components. Requires Oracle Data Mining database option.
- Sample Schema and Reports (454MB)
  Install sample schema with demo data and sample reports.

Database connection information
Enter database connection information

- Host Name
- Oracle Service Name
- SID
- Listener Port Number
- Password for system user
Post-Installation Steps

• Unlock the accounts
The installer will lock the BIA_RTL and BIA_RTL_MINING database accounts at the end of the installation. Login your database with DBA ID and PW to unlock these accounts:

(For BIA_RTL)
SQL> alter user bia_rtl account unlock;
  User altered.

(For BIA_RTL_MINING)
SQL> alter user bia_rtl_mining account unlock;
  User altered.

• Install OBIEE Repository, Catalog
• OLAP and ODM components
Customizing the Solution

- Fit-Gap Analysis
- The first task is to determine what is the gap between end-user reporting requirements and the predefined logical data model

A. Gap Analysis Task

1. Identify end-user Reporting requirements.

2. Identify client data sources.

3. Analyze predefined logical data model of ODWR Base Layer (examine provided ERDs):
   - Find Gap!
…Customizing the Solution

- Modify the logical model and generate scripts
- Change the physical layer using the changes
- Make changes to ETL to populate the base layer

B. Tasks to Perform *Before* Populating Base Layer

4. Modify logical model as necessary.

5. Instantiate the Base Layer physical model using provided scripts.

6. Run scripts to populate the Base Layer physical model.
Tasks to Perform on Analytic and Reporting Layers

- Modifying the models of the Analytic layer (OLAP, Data Mining), as needed
- Modifying the reports and dashboards (OBIEE), as needed

C. Tasks to Perform on Derived and Aggregate Layers

7. Modify relational, MOLAP, and mining models as necessary.

8. Modify reports and dashboards as necessary.
Changing the OBIEE Layer – Reports and Dashboards

• Workflow to changing the OBIEE Reports

1. Physical layer
2. Business layer
3. Presentation layer
4. Modify the reports in BI EE Answers
5. Modify the BI EE Dashboard using the reports
Checklist to Customize the RBIA

- Business requirement/ gap analysis, Source to target data element mapping
- Logical data model and report design enhancement based on gap analysis
- Physical database design customization/enhancement based on logical data model enhancement in the following areas:
  - Aggregate Layer
  - Derived Layer
  - Base Layer
  - Interface Layer
- Data staging strategy finalization
- ETL specification preparation
- ETL scripting, mappings and process flows definition (preferably using OWB)
- Intra-ETL changes (ETL between Base->Derived->Aggregate)
- BI solution customization/enhancement (based on gap analysis finding)
  - Prepackaged ETL scripts
  - BI reports – relational
  - OLAP cubes and reports, Mining models and reports
Supporting Threads

• BI solution system testing
• User documentation – operation manual with ETL process details and so on
• User training
• User acceptance testing
• BI solution deployment in production environment
• Production data load into the data warehouse
  • Initial
  • Incremental
• Maintenance support
Summary

- Looked at needs of Retail Industry
- Looked at how Business Intelligence and Advanced Analytics can help solve some of the Retail issues
- Use of BI Accelerator – reduce risk and speed up the technology implementation
- Some screen shots and sneak peak
Questions

- Contact info:
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  SNath@Deloitte.com