Keeping Your Data Warehouses Relevant in a World of Business Change

DAMA – National Capital Region Chapter
September 14th 2004

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Kalido, Inc.
Agenda

- Data warehousing – the challenges
  - Introducing Data Warehouse Lifecycle Management
  - The KALIDO product suite
  - Case studies
  - Summary & Questions
Data warehousing

The purpose:

• Provide accurate, timely management information for large enterprises
• Enterprise-wide view of performance spanning multiple business units, operational systems, physical structures and identification schemes
  > Visibility of business performance
  > Improved ability to react to competitive pressures
  > Compliance with regulatory requirements: Sarbanes-Oxley, Basel II etc.
Today’s Business Intelligence Landscape

Buy
Operational Systems
- SAP
- Oracle
- PeopleSoft/JDE
- Siebel
- I2
- Legacy

Buy
ETL/EAI
- Informatica
- Ascential
- Business Objects
- JMS
- IBM
- BEA
- Tibco

Build
Custom-built data warehouse

Buy
BI Reporting
- Business Objects
- Cognos
- Microsoft
- Hyperion
- IBM

Buy
DBMS
- Oracle
- Microsoft
- IBM
- Sybase
- Teradata

KALIDO
Custom-Built Data Warehousing Challenges

1) Traditional software development
2) Rigid structure—slow to adapt
3) Business complexity hard to model
4) IT resource-intensive process
5) Harder maintenance as scope extends

Long, risky development
Requirements backlog
Compromise on key requirements
High costs
Integrity degrades over time; limits lifespan
Any change in business requirements potentially means:

- Changes to the database structure
- New load routines and transforms
- New validation programs
- New summarization programs
- New performance optimization
- Reconfiguring of reporting tools

Data warehouses – inflexible by design
Industry truths

“the average cost of building a custom data warehouse for a financial ERP system is $2 million, it usually takes 2 years to complete. Most distressingly, more than 50% of data warehousing projects fail. This is ‘2-2-50’ problem is inescapable.”

- Ovum Research

“Most data warehouse project plans focus entirely on technical aspects of the initial implementation and change is thereafter seen as a production issue. This does not reflect reality. Enterprises need to adopt a methodology where both business and IT align themselves during the entire lifecycle of the data warehouse”

- Frank Buytendijk, VP at Gartner, Inc.
Data warehouse and business out of step

• Data warehouse design is based on a business model as frozen at a point in time
  > Changes during development are ignored
  > Subsequent changes are restricted to avoid costly re-design

• Information output requirements are defined prior to development
  > User requirements for reporting, queries and analysis are ‘hardwired’ into the fabric of the data warehouse
  > New business requirements and corrections result in complex, costly changes
  > Users are expected to accurately define requirements before the information is available

• Relevance
  > Performance measurement loses relevance as business changes are not rapidly reflected in the data warehouse and BI
  > IT and business misalignment increases
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IT and Business Alignment

Business Cycle:
- Evaluate
- Plan
- Run

IT Cycle (Data Warehousing):
- Prepare
- Design
- Build
- Test
- Implement
- Analyze
- Operate

Alignment:
The business and IT models need to stay in alignment.

Report, Plan, Model, Analyze

New Business Requirements

Information Disconnect:
time-delayed, incomplete and/or inaccurate business reports and analyses

(Data Warehousing)
Data Warehouse Lifecycle Management

Data warehouse lifecycle management is the management of one or more data warehouses throughout their operational life, from initial inception through creation, operation and a lifetime of modification.

Delivering the adaptive data warehouse:

- **Approach:**
  - Rapid iteration
  - Federation

- **Key architectural principles**
  - Generic storage
  - Business model driven delivery
  - Managed master data
  - Real-world business modeling
  - Time variance/Corporate Memory
Data Warehouse Lifecycle Management - Approach

- **Rapid Iteration**
  - Frequent, small scale iterations
  - Low risk
  - Less resource-intensive

- **Federation**
  - Set of geographically/organizationally disparate data warehouses
  - Logically one warehouse sharing a core model & common master data
  - Local autonomy & customization
  - Global consistency & control
  - Reduced risk in global roll-outs
Data Warehouse Lifecycle Management - Architecture

- **Generic storage**
  > Reduced schema & facility reuse
  > Increased flexibility

- **Business model driven delivery**
  > Configure warehouse at business model level not physical database level
  > Minimize business <> IT consultation and mapping

- **Managed master data**
  > High quality master data produces reliable context for performance management
  > Repository and process for ongoing management of master data is needed

- **Real-world business modeling**
  > Model underlying nature of objects rather than their use or role
  > Reduce structural changes by modeling real-world entities

- **Time variance/Corporate Memory**
  > Time-variant hierarchies are crucial for performance comparison in a changing business context
  > Capture history of object attributes, relationships and structures
DWLM Summary

“Management of the data warehouse lifecycle helps improve the timeliness and quality of management information and reduces the risk of decision making from wrong data, as it provides an environment to help the IT organization reduce the backlog of data warehouse change requests.”

- Andreas Bitterer, Research VP, META Group

- Data warehouse lifecycle management:
  - Iterative approach to data warehouse development
  - Aligns information systems with business requirements
  - Adaptive data warehouses driven by real-world business models
  - Corporate memory maintained
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Major KALIDO® DWLM Suite Capabilities

- Business Modeling: Real-world model of your business
- Master Data Management: Common business vocabulary
- Corporate Memory Management: What is, What was, What could be
- Data Warehouse Automation: Data warehouse and data mart generation
- Data Warehouse Federation: Global and local data warehouses acting as one

Enables

KALIDO Adaptive Services Core
Traditional Data Modeling

- Business model manually translated to data model
- Business changes invalidate the data model
KALIDO Adaptive Services Core Technology

- Change business models without changing data models
  - Patented
  - 125 person-years R&D
  - ISO 15926 standard

- Enables KALIDO® DWLM Suite facilities
Storage model

<table>
<thead>
<tr>
<th>Product Group</th>
<th>Product Group Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ice Cream</td>
<td>ICE</td>
</tr>
<tr>
<td>Sorbet</td>
<td>SOR</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Packed Product</th>
<th>Packed Product Code</th>
<th>Product Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chocolate Delight</td>
<td>CD</td>
<td>ICE</td>
</tr>
<tr>
<td>Chocolate Stick</td>
<td>CS</td>
<td>ICE</td>
</tr>
<tr>
<td>Mint Delight</td>
<td>MD</td>
<td>ICE</td>
</tr>
<tr>
<td>Toffee Surprise</td>
<td>TS</td>
<td>ICE</td>
</tr>
<tr>
<td>Vanilla Fudge</td>
<td>VF</td>
<td>ICE</td>
</tr>
</tbody>
</table>

Class

Product Dim

- Product Group
- Packed Product

Association Between Classes

Association Between Items

Classify

Item
### Generic Storage - Simplified Worked Example

#### Table

<table>
<thead>
<tr>
<th>ID</th>
<th>Entity</th>
<th>Name</th>
<th>Type</th>
<th>Parent</th>
<th>Child</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Object</td>
<td>Product Group</td>
<td>CBE</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>Object</td>
<td>Packed Product</td>
<td>CBE</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>Assoc</td>
<td>Grouped By</td>
<td>ABCBE</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>Object</td>
<td>Ice Cream</td>
<td>BE</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>Object</td>
<td>Mint Delight</td>
<td>BE</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>Assoc</td>
<td></td>
<td>Classify</td>
<td>1</td>
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<td>Classify</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>8</td>
<td>Assoc</td>
<td></td>
<td></td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

- **Product Group**
  - Ice Cream
  - Mint Delight
- **Packed Product**
  - Chocolate Delite
  - Chocolate Stick
  - Lemon Sundae
- **Object**
  - Ice Cream
  - Mint Delight
  - Toffee Surprise
  - Vanilla Fudge
  - Sorbet

#### Diagram

- **Class**
- **Association Between Classes**
- **Classify**
- **Item**
- **Association Between Items**
Generic Storage - Applied

Usage of the generic data table:

<table>
<thead>
<tr>
<th>ID</th>
<th>Entity</th>
<th>Type</th>
<th>Parent</th>
<th>Child</th>
</tr>
</thead>
</table>

System meta data:
- Class
- Dimension
- Measure
- Query

Seed or Standard Data:
- Year
- Current Year
- Previous Year
- 1994

User's data model:
- Product
- Product Group
- Packed Product
- Ice Cream
- Chocolate Delite

User's Master data:

Additions to the user data model:

Additions to the user's master data:
Modeling Complex Hierarchies

How It's Sold
- Brand Manager
- Brand Category
- Product Family
- Product Name
- Saleable Product
- Packaged Product

How It's Packaged
- Packaging
- Packaged Product
- USA Packed Product
- Germany Packed Product

Its Features
- Product Classification
  - Product Class
  - Product Sub Class
  - Product Group
  - Product Sub Group
- Product Type
- Product Features
- Greek Govt Class
- German Market Class
- Oil Spec
- Greek Govt Group
- German Market Group

What It Does

>> Extending the model simply means adding more data

Extending the model simply means adding more data.
Optimized for Maintenance and Reporting

**Logical Model**

- **Product**
  - Brand Manager
  - Product Family
  - Base Product
  - Sales Product

- **Brand Manager**
  - managed by

- **Product Family**
  - a member of

- **Base Product**
  - branded as

- **Saleable Product**

**Star Schema**

- Saleable Product
- Base Product
- Product Family
- Brand Manager
- End Date
- Start Date

**Automatic and Highly Optimized Generation and Maintenance of Hybrid Slowly Changing Dimensions**
KALIDO® DWLM Suite: Data Warehouse Automation

- Data warehouses, marts automatically built & maintained
- Deliver value months faster
- Empower business users with self-service

ETL & Sources

Adaptive Services Core

Data Warehouse Schema & Content

Business Model & Master Data

- Auto Loads Master Data
- Auto Loads Transactions

Auto Builds

Business Intelligence
- Marts
- Universes
- Report files
- Cubes

Auto Generates

Meta Data

Master Data

Transactions
KALIDO® DWLM Suite: Master Data Management

Enterprise Data Warehouses

“Harmonized” business intelligence

“Golden Copy” Reference Data

ETL/EAI

Reference Data

KALIDO® MDM™

Business users browse and manage master data via the web

“Master reference data warehouse”

- Workflow
- Modeling
- Searching
- Versioning
- Mapping
- Segmenting

- Merging
- Cataloging
- Security
- Validation
- Authorization
- Publishing

Golden Copy

Reference Data

Harmonized business intelligence

KALIDO® DWLM Suite: Master Data Management

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Kalido Product Suite - DWLM

Dynamic Information Warehouse:
- Full DW lifecycle management
- Complex and changing business models
- Time-variant data (slowly-changing dimensions)
- Distributed DW management

Master Data Manager:
- Central store for shared information
- Create, manage, authorize and publish master data
- Maintain central key master data over the web
- Handle any type of structured data including product, customer, and meta data
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Case Study – HBOS plc.

Project
• Integrate supplier information following merger of Halifax and Bank of Scotland
• Reconciliation of inconsistent coding across disparate operational systems
• Requirement to handle on-going organizational change
• Solution – a flexible Supplier Relationship management system

Benefits
• Phase 1 delivered in 3 months
• Significant reduction in supplier database
• Substantial procurement cost savings already delivered – a key objective of the merger
• Enables management of complex suppliers and negotiations
Shell Oil Product Mgmt. Information System (OPMIS)

**Project**
- Global data warehouse – 96 countries
  - Federated rollout & consolidation
- SAP, JDE and SunSystems ERP

**Benefits**
- Estimated Benefits : $140M per year
  - Margin improvement
  - Speed of new business integration
- Consistent performance reporting & single view of customers and products
- Completed on target & within budget

“Our Intelligence Systems now accelerate insight and allow us to respond to business change quickly and with the most appropriate strategy.”

*Jim Smitheman*
*Management Information Mgr.*
Unilever Universal Information Project

Project

- Integrate global brands data
  - Support ‘Path to Growth strategy’
- Consolidate reference data
- Transaction feeds from SAP
- Staged rollout by operating company

Benefits

- Better brand data delivered to managers worldwide
- Improved supply chain performance
- Adapt to M&A activity
- Corporate transparency & memory

"With KALIDO, we manage world-wide operations data over time, and as the organization changes, this complete, consistent intelligence spurs our corporate growth strategy."

Chris Broe
Head of Unilever Information Program
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DWLM Summary

- Data warehouse lifecycle management:
  > Lowers risk
  > Enables performance management
  > Delivers unprecedented flexibility and time-to-market

- Keeps the data warehouse relevant!

- Proven benefits delivered by Kalido DWLM:
  > Philips Electronics cut DWLM cost and business intelligence latency by more than 50%
  > Halifax Bank of Scotland drove GBP300M in procurement cost savings following their merger
  > Cadbury Schweppes successfully integrated a major corporate merger in 8 weeks